

THE IRON AGE

New York, February 6, 1919

ESTABLISHED 1855

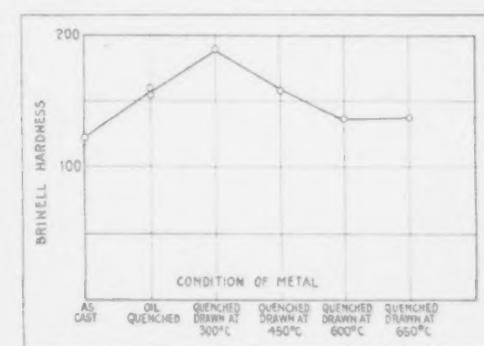
VOL. 103 : No. 6

Effect of Heat Treatment on Bronze

Characteristics Disclosed by Brinell Hardness Tests and Photomicrographs—Quenching and Drawing Give Greater Hardness Than Quenching Alone

BY F. F. HAUSEN AND O. A. KNIGHT*

AN investigation of the effect of heat treatment on the microstructure and Brinell hardness of bronze brings out the fact that quenching from 800 deg. C., followed by drawing at 300 deg. C. gives a Brinell hardness greater than quenching alone. This is to be expected from a study of the microstructures, as more alpha is present in the quenched specimen than in the one quenched and drawn. Drawing above 300 deg. C. shows a

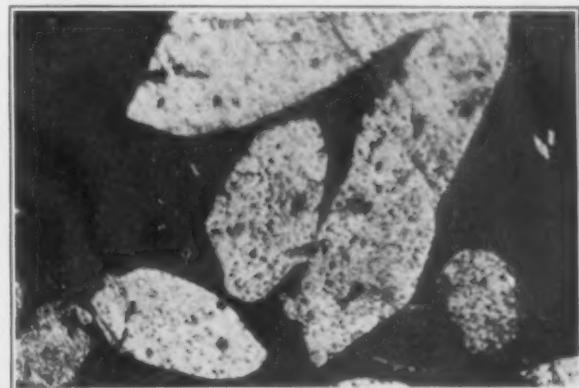
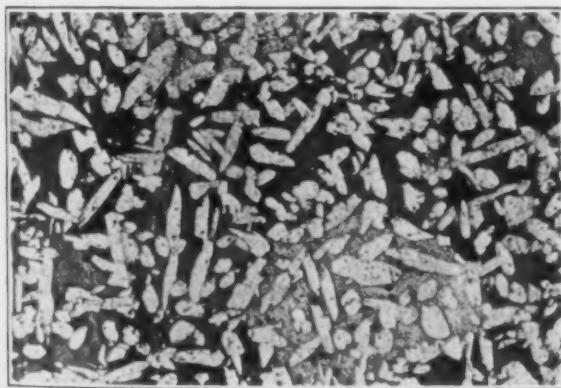


*E. F. Hanson is instructor in metallurgy and metallography, Pennsylvania State College, and O. A. Knight is general metallurgist, Bethlehem Steel Co.

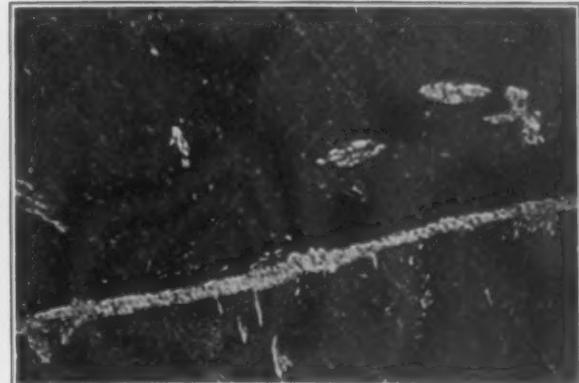
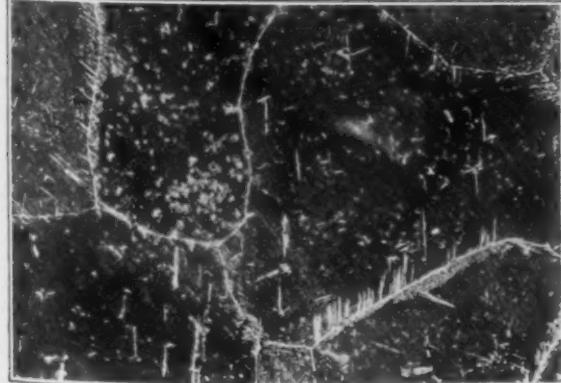
decrease in the hardness accompanied by an increased amount of alpha constituent liberated.

The bronze investigated was of the following composition: Cu = 59, Zn = 39, Fe = 1.5, and Mn = 0.5 per cent. The physical properties in the cast condition were: Tensile strength, 65,400 lb.; elongation in 2 in., 41.3 per cent; contraction, 39.6 per cent; Brinell, 121.

The cast bronze was examined and photomicrographs and Brinell hardness taken. Then specimens about 1 cu. in. in size were heated to 800 deg. C., held at that temperature for two hours,

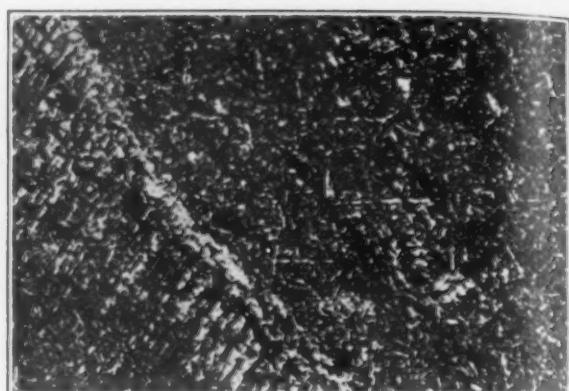


Figs. 1 and 2—The Bronze in the Cast Condition. Brinell 121. The light alpha crystals are imbedded in a dark background of beta

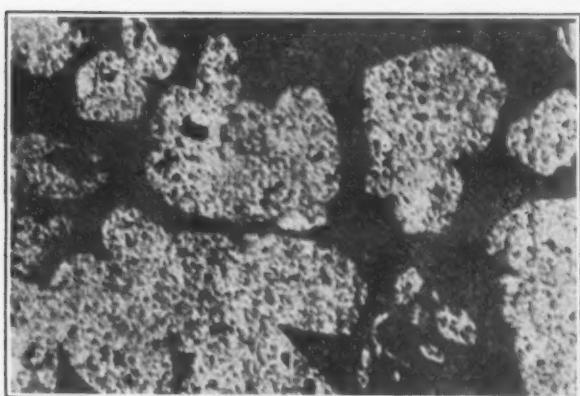


Figs. 3 and 4—The Bronze After Heating to 800 Deg. C. for Two Hours and Quenching in Oil. Brinell 156. The greater part of the alpha is retained in solution

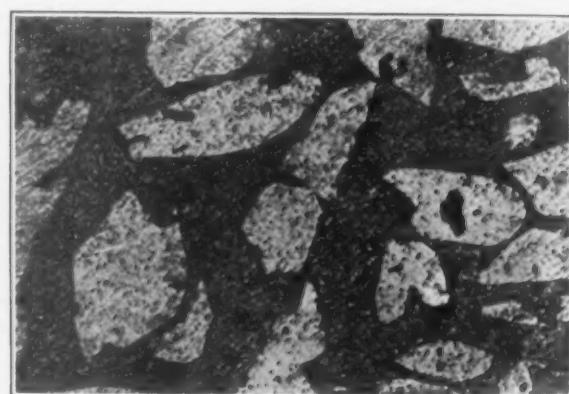
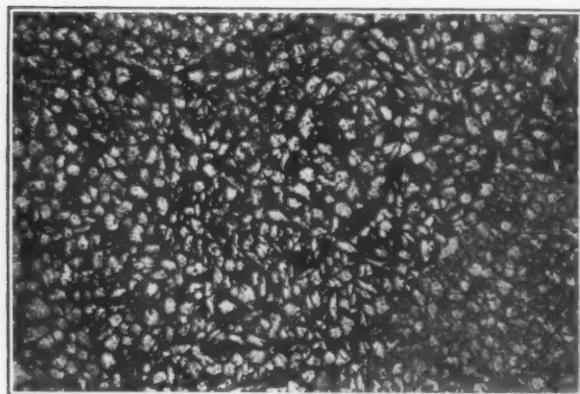
THE SPECIMENS IN THE LEFT COLUMN ARE SHOWN MAGNIFIED 50 DIAMETERS; IN THE RIGHT COLUMN, 500 DIAMETERS. ALL SAMPLES WERE ETCHED IN ROSENHAIN'S REAGENT



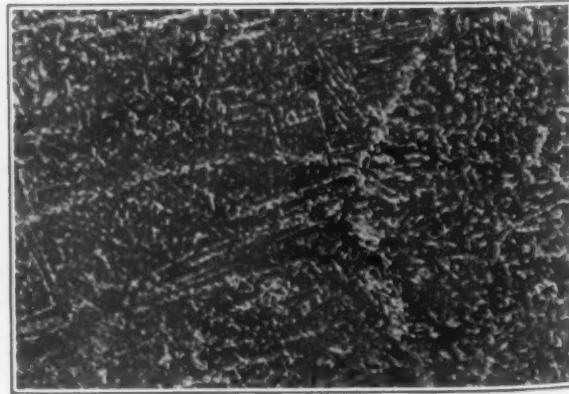
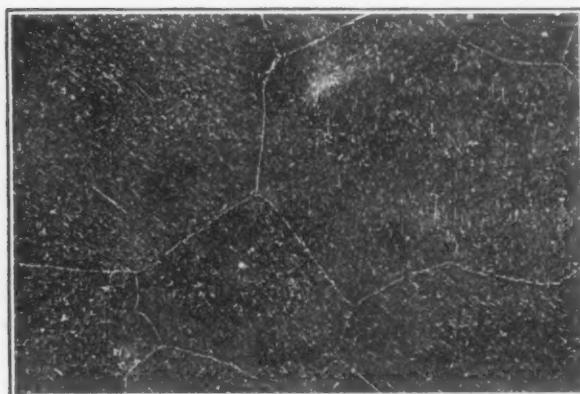
Figs. 5 and 6—Drawn at 300 Deg. C. Brinell 187. The alpha is shown fairly well distributed



Figs 7 and 8—Drawn at 450 Deg. C. Brinell 156. A little more alpha has separated out of solution



Figs. 9 and 10—Drawn at 600 Deg. C. Brinell 137. The normal amount of alpha has separated from solution, but it is distributed in finer particles than in the untreated sample of Fig. 1



Figs. 11 and 12—Drawn at 650 Deg. C. Brinell 137. The structure is almost identical with that produced by drawing at 800 deg. C.

ALL OF THE ABOVE SPECIMENS WERE HEATED TO 800 DEG. C., HELD AT THAT TEMPERATURE FOR TWO HOURS, QUENCHED IN OIL AND THEN DRAWN FOR ONE HOUR AT THE TEMPERATURES GIVEN. ALL SAMPLES WERE ETCHED IN ROSENHAIN'S REAGENT. THE PHOTOMICROGRAPHS IN THE LEFT COLUMN ARE 50 DIAMETERS; THOSE IN THE RIGHT, 500 DIAMETERS

quenched in oil, and Brinell hardness and photomicrographs taken. Samples were then drawn for one hour at 300 deg. C., 450 deg. C., 600 deg. C., and 650 deg. C. respectively, after which they were examined microscopically and the hardness determined.

Figs. 1 and 2 show the structure of the metal in the cast condition after etching with Rosenhains reagent, with the light alpha crystals imbedded in a dark background of beta. Figs. 3 and 4 show the structure after quenching in oil from 800 deg. C., with the greater part of the alpha retained in solution. A small amount is seen to be around the crystal boundaries and a little in the cleavage planes. Figs. 5 and 6 give the structure of the specimen quenched at 800 deg. C. and drawn at 300 deg. C. for one hour. This has the appearance of being more in the beta state than that which was quenched only. The alpha is very finely distributed. Figs. 7 and 8 are of the sample quenched at 800 deg. and drawn at 450 deg. A little more alpha is seen to have separated out of solution. Figs. 9 and 10 show the structure of the specimen quenched at 800 deg. C. and drawn 1 hour at 600 deg. C. Here it will be seen that while the original outline of the large grains produced on quenching still persists, the normal amount of alpha has separated from solution. It is distributed in finer particles than in the untreated specimens of Fig. 1. Figs. 11 and 12 give the structure of the specimen quenched from 800 deg. C. and drawn 1 hour at 650 deg. C. The structure is almost identical to that produced by drawing at 800 deg.

A somewhat strange phenomenon occurs in the Brinell hardness, as well as in the microstructure. It will be noticed in Fig. 5, which was quenched at 800 deg. C., and drawn 1 hour at 300 deg., that there is decidedly less alpha present than in Fig. 3, which was quenched and not drawn. The Brinell test verifies the conclusion to be drawn from the microstructure, *i.e.*, that the specimen drawn at 300 deg. C. would be the hardest.

In order to verify this portion of the experiment another specimen was heated to 800 deg. C., held at 800 deg. 2 hours, oil quenched, and tested for hardness. It was then drawn 1 hour at 300 deg. C., and the hardness again determined. The result was the same as at first, *i.e.*, the one drawn at 300 deg. was decidedly harder than the one quenched only. Above 300 deg. the hardness gradually decreased with the rise in drawing temperature, as is to be expected from the micrographs. In all cases the microstructure and Brinell hardness agree, as the specimen quenched at 800 deg. and drawn at 300 deg., is the hardest, and has the most beta constituent.

The Brinell tests, as related to the heat treatment, is given below in tabular form:

Treatment	Brinell Hardness
Cast	121
Quenched in oil at 800° C.	156
Quenched in oil at 800° C.	163
Quenched in oil at 800° C. and drawn at 300°	187
Quenched in oil at 800° C. and drawn at 300°	190
Quenched in oil at 800° C. and drawn at 450°	159
Quenched in oil at 800° C. and drawn at 600°	137
Quenched in oil at 800° C. and drawn at 650°	137

CARBON STEEL CO. ADDITIONS

Forge Building Erected—Jobbing Plate and Steel Mill Soon to Be Completed

The Carbon Steel Co., Pittsburgh, during the past few months, has completed some important extensions and improvements. These include the erection of a forge building, 60 x 389 ft., equipped with one 1000-ton and two 500-ton steam hydraulic presses and one 6000-lb. and one 3000-lb. steam hammers, overhead traveling cranes, heating furnaces and other necessary equipment, so that its facilities for producing both heavy and light forgings are complete and up to date. The company during the past year has also enlarged its heat-treating plant, which now includes two 1000-ton plate straightening presses, five Rockwell type, four Tate-Jones and two Bellevue heat-treating furnaces.

The improvements now being made include the installation of a 72-in. jobbing plate and sheet mill, to be completed within the next 60 to 90 days, the housings and pinions for which were built by the United Engineering & Foundry Co., and the electric drive and tables, etc., are being furnished by Mackintosh, Hempill & Co. Also a two-story machine and finishing shop, equipped with lathes, straightening and cutting off machines; rebuilding of its boiler house and the installation of five new Stirling 800-hp. water tube boilers, which will give the company a total rated capacity of 6000 hp. These boilers are to be equipped with Westinghouse underfeed stokers and modern coal storage and handling facilities. The company has also extended its soaking pit building, which is equipped with additional traveling cranes and ample heating facilities to take care of the additional output of finished forgings, plates and sheets. All the new buildings are heavy steel construction and modern in every particular. A new water supply system is also in process of construction, consisting of a concrete well which is being sunk in the river, equipped with modern high-pressure pumps. The new gas producer plant, which was built by Arthur G. McKee & Co., Cleveland, and completed early last year, is working very satisfactorily. Although the company

is at present using natural gas in certain departments, the producer plant, together with the output of the Kittanning mines, insures the company a fuel supply ample to meet its entire requirements.

Large storage bins for scrap, pig iron and other materials, with rearranged trackage facilities, have been installed. With these improvements its plants will be thoroughly up to date in every respect, and the added facilities will insure increased production of high-grade special steels.

Some time ago the company bought a very desirable manufacturing site of 103 acres across the Allegheny River from its Rebecca furnace at Kittanning, Pa., about 45 miles from Pittsburgh. This property was chosen not only on account of its proximity to the blast furnace, but also on account of its favorable situation as to both river and rail transportation facilities. It was the intention at the time the purchase was made to utilize the property in the erection of a new steel plant and finishing mills, in order to take care of large contracts for war materials which it was making for the Government. However, when the war stopped the necessity for early utilization of the property was removed, and up to the present time the company has not definitely decided just how or when the property will be improved. The report that it would soon start work on the building of an open-hearth steel plant is incorrect.

The Kittanning Iron & Steel Mfg. Co., the controlling interest in which is owned by the Carbon Steel Co., has lately repaired and relined its Rebecca furnace at Kittanning. Also during the past year the Kittanning company has developed and electrically equipped its coal mines in Armstrong county, and now has a daily output of approximately 1000 tons, which is used to supply the plant of the Carbon Steel Co. at Pittsburgh.

To stimulate interest in public works and civil construction Calvin Coolidge, Governor of Massachusetts, has announced the appointment of a special committee composed of representatives of labor and capital. He argues that the return to normal business life will not be accomplished by worrying over what may happen, but only by doing the tasks at hand.

UTILIZATION OF WASTE HEAT

Some British Experience in Boiler Installations in Open-Hearth Plants

Generating steam by the use of waste heat from open-hearth furnaces was discussed before the Iron and Steel Institute at its meeting in London, Sept. 12, 1918, by Thomas B. Mackenzie, in a paper entitled "The Utilization of Waste Heat from Open-Hearth Furnaces for the Generation of Steam." The author gives some results obtained from an extended experience and the paper is replete with detailed calculations and data. An abstract follows:

About 20 years ago, when the firm with which the author was connected was building new acid-lined open-hearth furnaces of a nominal capacity of 60 tons, it was decided to put down boilers between them and the chimneys in order to generate enough steam to blow the gas producers. Three Cornish boilers, 30 ft. long and 7 ft. in diameter, with a single 42-in. internal flue, were duly erected, but owing to the cooling effect on the gases the draught of the furnaces was reduced and their operation slowed down to such an extent as to compel the abandonment of this attempt to utilize the waste heat.

An Experimental Plant

Later it occurred to the author that the problem could be solved by placing an induced draught fan beyond the boiler, and this method was tried with an acid-lined open-hearth furnace of ordinary construction and of 30 tons nominal capacity. In series with a Green's economizer having a heating surface of 720 sq. ft. was placed a Babcock and Wilcox water-tube boiler with a heating surface of 1619 sq. ft., the fan adopted being of the Keith and Blackman type, with an impeller 20 in. in diameter driven by a veritable-speed direct-current motor of 20 b.h.p. Originally two openings were made in the steel chimney attached to the furnace—a lower one to admit the waste gases to the boiler and a higher one for their return after passing over the heating surfaces of the boiler and economizer, a cast-iron butterfly damper being fitted in the chimney between the openings. This arrangement did not work satisfactorily, as the damper could not be kept tight; a plate damper was, therefore, fitted to the top of the chimney, the upper opening closed, and the fan arranged to discharge direct into the air.

The results obtained having indicated that the arrangement was quite practicable and did not interfere with the furnace output, it was decided to provide similar equipment for a new plant containing open-hearth furnaces of 45 tons nominal capacity. The equipment for each furnace consisted of a Babcock and Wilcox water-tube boiler with a heating surface of 1827 sq. ft., a Green's economizer with a heating surface of 960 sq. ft., and a Keith and Blackman fan with a 30-in. impeller, driven by a 40-b.h.p. variable-speed direct current motor. The fans discharge through short funnels direct into the atmosphere. The furnace chimneys have disc plate dampers at the top, which are kept nearly closed when the boilers, economizers, and fans are in operation. The reasons for not keeping the dampers fully closed are two—one, that the boilers and fans are rather small, and the other a fear lest an explosive mixture should become pocketed in the chimney at each reversal, with the risk of "kicks" taking place and damaging the plant. This plant was put to work shortly before the war, but no tests were made.

Test Results

Since the war the author has been jointly responsible for adding seven boilers and fans to old furnaces and 10 to new furnaces, and he regards it as unfortunate that the theory was not developed, for if it had, larger boilers would have been used and more steam obtained. Tests have since been made, and the paper gave full details of the data obtained and of the heat balance-sheets calculated for five installations with

open-hearth furnaces of respectively 30, 45, 100, 60 and 60 tons nominal capacity. For these the amount of heat usefully employed in the boilers was 1,555,000, 2,540,000, 2,360,000, 2,934,000, and 3,031,000 lb. cal.; the weight of steam of dryness factor 0.95 generated per hour was 2440 lb., 3792 lb., 3728 lb., 4616 lb., and 4736 lb., and the weight of steam per ton of ingots was 1084 lb., 949.3 lb., 855.3 lb., 1252 lb., and 796.9 lb. The average of these weights of steam per ton of ingots is 987.5 lb. As only one of the boilers tested was receiving all the products of combustion and was too small to deal properly with the amount, and the others were using only about two-thirds of the products from their respective furnaces, there seems reason to believe that at least 1200 lb. of steam per ton of ingots would be obtained under more favorable conditions.

Experience has shown that in a steelworks which is making plates and bars, and in which the power plant is not particularly up to date, most of the mill engines being of the simple high-pressure type and the ranges of considerable length, the steam consumption works out at 3200 lb. per ton of ingots. Even in such a case, therefore, the saving in boiler fuel that could be effected by the use of waste heat boilers on the furnaces would be 43.75 per cent. Another source of steam would be the waste heat from the reheating furnaces. The volume of products would be less per furnace, but tests indicate that the temperature is higher. On a conservative estimate, therefore, it would appear that a saving of 50 per cent in boiler fuel can be made by utilizing heat that at present in nearly every case is going to waste.

With regard to the actual setting of the boiler, economizer and fan, it is important to keep the passages short and direct, avoiding all quick bends, and also to do everything possible to prevent air leakage. Plenty of explosion doors must be provided, and they must be airtight when closed. So important is the prevention of air-leakage that in the author's opinion when waste heat boilers are to be used the air valves of the furnaces should be water-sealed, as the butterfly valves commonly used for air are far from airtight.

Secretary of Labor Warns Manufacturers

In a recent address to the Lawyers' Club of New York, Secretary of Labor Wilson made an appeal to American manufacturers to "get your business going and keep it going." He warned that if the country has any great period of industrial unrest we may have a revolution such as the French Revolution, or we may have Russian Bolshevism. He said in part:

The same spirit that dominated the American people during the war must thrill them during the period of reconstruction. We now face the demobilization of our war industries and their work and the readjustment to a post-war basis. If every man would realize that he should get going, get established on the same basis as before the war, this problem would be simplified. Many think this unwise because of present war prices, the costs of materials, and the cost of labor, and that the thing to do is to wait until prices go down. That would be unwise. My vision of the situation is that there will not be more than a four or six months' interval between the signing of the armistice and getting into the post-war swing.

If there is any attempt to force down wages unduly, it will be met with a resistance of sufficient strength and duration to frustrate it, and in this connection I want to say that if we have any great period of industrial unrest, there is no one who can tell where the resultant social upheaval will leave us. We may have a revolution such as the French Revolution, or we may have the Russian Bolshevism.

In its series of Spanish Texts of Standard Specifications the Bureau of Foreign and Domestic Commerce has issued two additional numbers. They are "No. 3, Standard Specifications for Open-Hearth Steel Girder and High Tee Rails," and "No. 4, Low-Carbon Steel Splice Bars." Copies of these documents may be obtained for 5 cents from the Superintendent of Documents, Government Printing Office, Washington. They were prepared under the supervision of the Bureau of Standards. The English text is copyrighted in the United States by the American Society for Testing Materials. The Spanish text is not copyrighted.

Pulverized Coal for Metallurgical Furnaces

Greater Efficiency Claimed for Furnaces of Correct Design—Continuous Service More Certain—Average Combustion Figures for Different Furnace Types

BY CHARLES E. LONGENECKER*

THE output of any furnace is dependent on the maintenance of a sufficient furnace temperature, the furnace design, and the human factor.

To maintain a temperature as required by the particular heating process requires that the requisite amount of heat be generated. The quantity of fuel needed to generate the necessary heat will depend on the degree of approach to perfect combustion. The design of the furnace will determine the efficiency of application of this heat to the stack and hence in a large measure controls the amount of fuel. Unless a furnace is handled intelligently, there will be a waste of fuel and the output, other factors being constant, will be in direct ratio to the intelligence shown. Overheated stack means a loss of heat and of course a poorer quality of material.

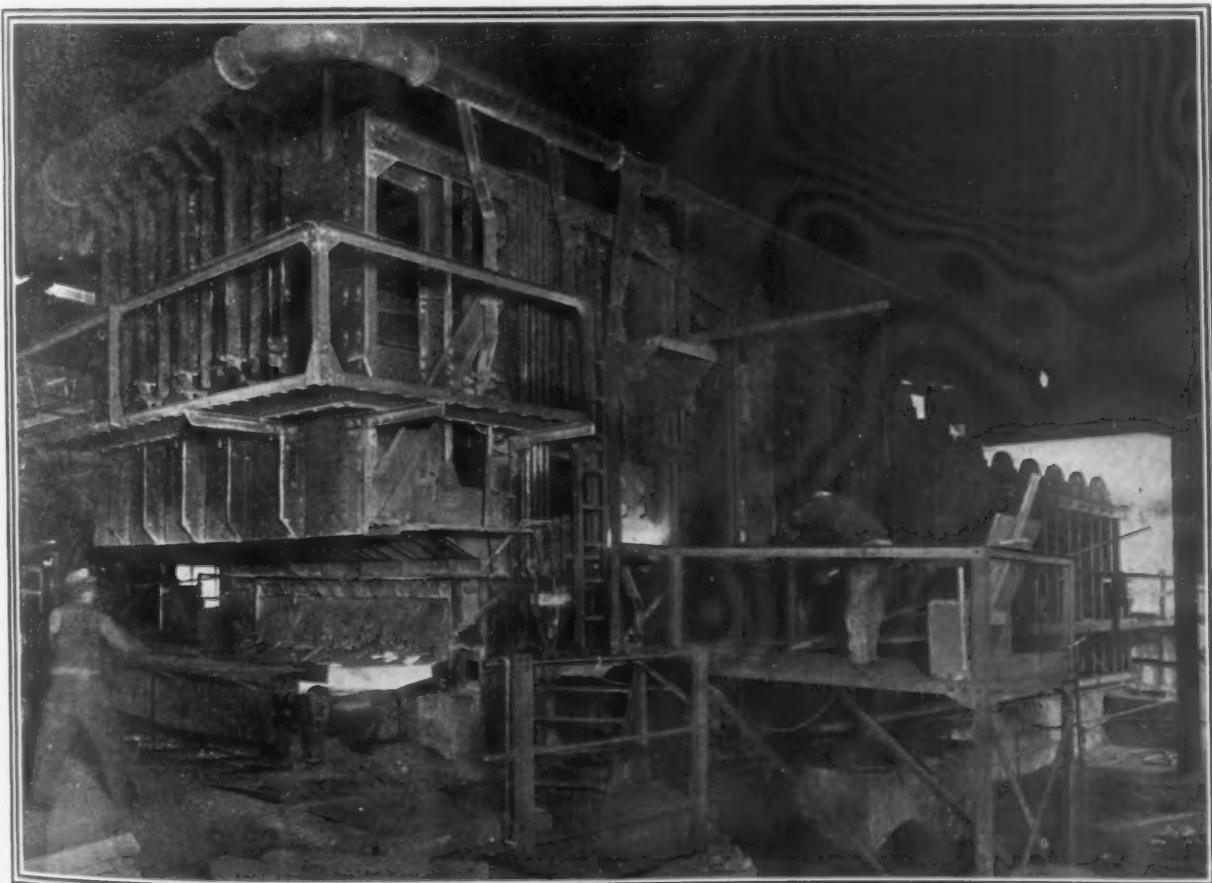
The use of powdered coal has invariably given an increased production as compared with that obtained from the fuel supplanted where the furnace design has been correct. This has been largely due to the fact that powdered coal of all the fuels, is the best method by which to obtain the perfect combination of air and coal which produces the highest degree of perfect combustion. Where failure has resulted, it has been caused

in a majority of cases by application to furnaces built for other fuels, and not altered or in furnaces designed with insufficient knowledge of the characteristics of powdered coal in burning.

The third factor, cost of repairs, is largely governed by the furnace design and this has a greater influence on the life of the refractories than the fuel. If the furnace is properly constructed, there will be no increase in this cost when using coal dust. With certain coals, especially those containing a high percentage of ash, there will be some clogging of any small passages but this can be overcome by conveniently locating clean-out openings and by correct draft conditions. The fusing point of the ash of some coals is lower than that of others, hence the ash of such coals naturally will have a greater tendency to adhere to any surfaces with which it comes in contact, but as a rule this deposit can easily be removed if provision is made to make these surfaces accessible.

The labor cost connected with the handling and preparing of the coal will include the drying, pulverizing and conveying to the burners. Originally, the coal was conveyed from the main station to the furnaces by spiral screw conveyors but this method has been almost wholly superseded by pneumatic distribution, which is much simpler and less costly to operate and maintain.

*The author is erecting engineer with the Bonnot Co., Canton, Ohio.



Typical Installation of a Billet Heating Furnace Using Powdered Coal

The cost to prepare a ton of powdered coal is approximately the same as is the cost to gasify a ton of coal in a mechanically operated producer. The low price of the raw coal, as compared to other fuels, many times off-sets the cost of preparation.

Continuous service is more certain with pulverized coal than with any other fuel as the supply of coal is more abundant. There is no other fuel which so readily responds to correct application and upon which results can be so easily maintained as desired. Provision is made in all installations of the present day, for duplicate operating units so that should there be a breakdown of the one in service, the alternate can be immediately started.

Unless the furnace operator can give his entire attention to the heating and handling of the stack a high efficiency cannot be maintained. This means that he should be protected from in-

tense heat and noxious gases as far as necessary to his comfort. To assure this there should be properly designed vents and hoods to carry off any products of combustion not disposed of by the stack. The gases generated in the burning of powdered coal are adequately taken care of by these means.

The following are average figures taken from practice giving the consumption of pulverized coal in different types of furnaces:

	Lb. of Coal per Ton
Puddling	1000
Busheling	400 to 500
Billet	150 to 180
Forging	400
Annealing sheets	200
Sheet and pair	300
Tin	170
Open hearth	500 to 600
Copper reverberatory	300
Tin smelting	1400
Galvanized pots	100
Tire	330
Wheel	600
Continuous bloom	100 to 150
Rivet making	90
Boilers	3½ per boiler hp

The Steel Converter Process for Foundries*

Methods of Preheating—Danger of Overblowing—The Three Periods of the Blow

BY G. P. FISHER†

PIG iron, from our point of view, is very impure, because it contains quite a lot of carbon, some silicon and manganese, and there is always present some phosphorus and sulphur. In order to make pig iron into steel these impurities have to be removed. The process is an acid process; that is, one in which the furnaces and apparatus are lined with refractory material having silica as its base. It is possible to remove by oxidation carbon and manganese, but not sulphur or phosphorus. These need a basic lining, which is not suitable for steel converters. The first point we have to call attention to is the necessity of using melting stock low in phosphorus and sulphur to meet specifications of customers. In steel castings, 0.08 per cent sulphur and 0.06 per cent phosphorus are about the permissible limits in the finished steel; and as there is a tendency for these elements to raise rather than lower owing to the charge shrinking in weight while the same amount of sulphur and phosphorus remain therein, so in buying iron we should specify the contents of these two elements at about one-half of the above limits.

The class of pig iron is known as low phosphorus. In regard to elements aside from phosphorus and sulphur, it is well to have in mind that after the iron has been melted in the cupola and transferred to the converter no more external heat is applied, and in order to maintain and increase the temperature of the metal we have to depend upon heat generated by the combustion of the impurities—silicon and carbon. The iron contains approximately a uniform amount of carbon, about 3½ per cent. The silicon varies greatly, and it is generally on this content that pig is graded and bought. The iron which contains the greatest amount of silicon in proportion to its price, all other things being equal, is the cheapest to buy, as it contains the most of the principal heat-giving element and also enables the foundryman to carry a higher per cent of steel scrap in the cupola, and so cuts down material cost.

Regarding manganese, it is hard to find a pig which carries much of this, but it should be specified as high as possible, because its function is to hold down the sulphur content of the mixture. If there were no sulphur present in the mixture it would scarcely be necessary to have much manganese.

This brings us to the lining of the converter, which

is very important. Two things can be used: silica brick or ganister. Either method is good, but I believe ganister to be the better, inasmuch as it is a cheaper method of lining, and it lends itself readily to economical repairing. Next should be considered the pre-heating of the converter, and this is one of the most important points in the whole process, because if the converter is not pre-heated properly it makes bad blowing, results in cold metal and an excessive slopping during the boiling period. The two most common ways are by burning either crude oil or gas. In some places coke is used. It depends on local conditions as to which ever is the cheaper or better available. After the converter is hot and the iron melted it is put in the converter. The next most important item is the correct setting of the converter; in other words, getting the metal so it seems to just roll into the tuyeres. The foundryman may have hot iron and the right composition, but unless the converter is set right before commencing blowing he cannot expect to get good results. Uniformity in blowing and control of subsequent reactions will be lost.

The three periods of the blow are as follows: First, when the flame makes its appearance; this is the silicon period, for it is then the bulk of silicon is eliminated. The second is known as the boil or manganese period. At this time the latter is oxidized, going into the slag, making it thin, and accounting for its greater tendency to slop over and allow for the formation of a very long flame. The third, or carbon period, comprises all the time from the end of the boil to the end of the blow. The carbon first goes off gradually, but as it gets below 1 per cent the action speeds up very greatly, until carbon appears to be eliminated almost explosively. The brown smoke at the end is an indication that, having eliminated the other elements, the oxygen is now attacking the iron itself; and care must be exercised not to overblow, or the steel will be red hot, full of blow holes, and worthless for casting purposes.

The by-product coke plant which is being erected by the Wisconsin Steel Co., South Chicago, Ill., included in the list of by-product plants under construction as published in THE IRON AGE of Jan. 2, will consist of 88 Wilputte ovens with an annual capacity of 376,000 tons of coke. Contracts for the foundations have been awarded to Sumner Sollitt Co., 79 East Adams Street, Chicago. The plant will occupy an area of about eight acres at 110th Street and Torrence Avenue.

*From a paper read before the Pittsburgh Foundrymen's Association, Jan. 20.

†Metallurgist, Whiting Foundry Equipment Co., Harvey, Ill.

Women a Fixture in Electrical Industry

Special Provisions for Employment, Welfare and Safety Are Made by the Westinghouse Co.—Shop and Technical Courses Are Provided

OVERETTE girls at the works of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., are filling men's positions at the lathes, drill presses, milling machines, etc. Now that they have been at work over a year, and are making good beyond the most optimistic expectations, the 5000 now employed are to stay, and more will be admitted.

Realizing the instinctive timidity of girls seeking employment, the Westinghouse Co. maintains a separate employment office in charge of a woman highly trained in employment and welfare problems. Before the girl leaves the office, she is made to feel that the employment "mothers" are there for consultation and advice.

Training and Promotion Schools

When the new employee leaves the employment office, she is not put at shop work for three weeks or more. She spends this period in a training school where the fundamental machine operations are taught. The novice is prepared gradually and thoroughly, so that when assigned to a machine she has acquired the necessary self-confidence.

The training is short and intensive. O. F. Schendel, a graduate machine-tool maker, devotes his entire time to this work, teaching girls to read blue prints, to use the scale, the micrometer, how to set up machines, shop rules, discipline, the sys-

tem of wages, and other basic practices. Special instruction is then given on lathes, drill presses, assembling machines, grinders, shapers, screw machines, milling machines and bench work. No specified time is set for the course. Occasionally a girl showing unusual aptitude is retained for more highly skilled instruction, and again some girls require more time to learn the simpler operations.

Recently a class has been organized to train girls in lettering, tracing, mechanical drawing, mathematics and applied arithmetic. This course requires two years' previous training in high school work. This has been supplemented by a class for the training of shop clerks, production, time, cost and file clerks, and inspectors. They also are paid a day rate while learning.

In addition to the vestibule school, the Westinghouse Co. maintains a promotion school for old employees, who wish to advance or who desire a change of occupation. If such is the case, they are placed in this promotion school on part, or even full time, for intensive training. This school has the same economic features as the vestibule school, minimizing time in learning, and eliminating waste.

The trained girls enter the shops, capable of assuming some responsibility and prepared to operate machines. Of course operations where heavy lifting is required cannot be done by them.



The Belts on These Cutter Grinders Are Now Safe

but they excel in application and dexterity. Some seem to have a decided bent for mechanics. One girl has mastered 10 different operations on a drill press, and asked for a chance to learn more. She has also operated balancing machines, assembling ball racers, cones, and brush holders. Generally speaking, all the girls excel in assembling operations where application and speed count.

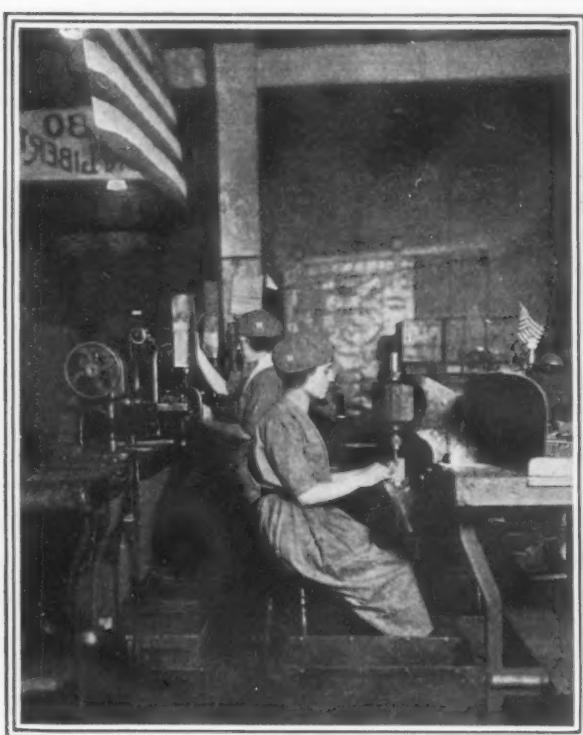
Safety and Welfare Features

Extra precautions are taken that every belt is guarded, and that the most improved safety appliances are used on the machines. The overette costumes are so designed that there is no danger of the clothing getting caught.

The women are paid a daily rate while learning, and receive a flat rate, a bonus, and certain premiums when in actual productive work. They work the same hours as the men, from 7 a. m.

courses of instruction planned primarily for the employees of the company, though admission is extended to all, regardless of occupation, previous education, or present places of employment. Its objects are to afford a general elementary training for the boy or girl, or the man or woman, who has been forced to leave the public school and earn a livelihood. Thousands of foreigners work in the valley and they need to learn our language and customs. Then there is the employee, who, having been denied the advantage of a technical school, desires to study electrical engineering. For him and for her a course is provided that is equivalent to that given in many engineering schools. The women's school affords instruction in sewing, the commercial branches, music, comptometer operation, and general clerical training.

The engineering department is open to women.



Sheet Metal Guards Are Used on These Drilling Machines

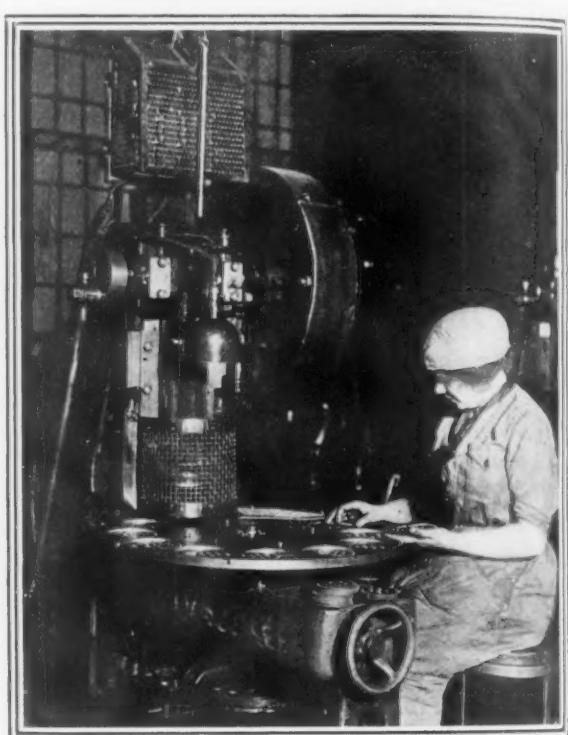
until 5 p. m. with three-quarters of an hour for lunch, and a half holiday Saturday afternoon. Lunch and rest rooms are provided, equipped with everything to make them attractive and home-like, and they are scrupulously clean. Here the girls bring their lunches and are served tea, coffee, and milk, free of charge. Besides these lunch and rest rooms, a cafeteria furnishes food at cost.

A separate relief department has been created, where the girls have trained nurses and a medical staff. But there have been few severe accidents.

Many girls have been attracted to the industrial work at East Pittsburgh from all sections of western Pennsylvania. Pittsburgh, like other munition districts, has been badly congested during the past two years, and a real problem has arisen in providing a place for the girls to live. In conjunction with the Westinghouse Co., the Western Pennsylvania League of Women Workers has organized a large community club at Turtle Creek, adjacent to East Pittsburgh, with recreational activities and dormitories.

Elementary and Technical Courses

A casino school is at East Pittsburgh, in the center of the Westinghouse industries, with



This Punch Press Operator Is Protected by Wire Screens

The course gives a clear comprehension of the scientific principles upon which practical work depends. Mathematics, drawing, physics, mechanics, English, chemistry, and a knowledge of materials form the basis of the course with specialization in steam and electricity. The student after completing the course should be well prepared to enter the field of steam and electrical installation, testing operation of power stations, wiring inspection, general road work, various assistantships in the shop, and special apprentice courses.

The Electric Furnace Co., Alliance, Ohio, has closed a contract with the Standard Roller Bearing Co., Philadelphia, for 1900-kw. continuous automatic heat treating equipment. The set consists of one 150-kw. electric furnace for hardening and one 40-kw. electric heated oil drawing bath. There will be supplied in addition an oil quench bath located between the furnace and the oil drawing bath. The furnace will be used for heat treating alloy steel balls and ball races, which will be automatically handled through the furnaces, quench and drawing baths in metal baskets.

The Liberty Foundry, St. Louis, was damaged about \$20,000 by fire last week, the blaze originating in the cupola room from heated metal. The operations of the foundry were not seriously interfered with.

Potash Content of Blast Furnace Charges

Alabama Iron Ores and Foreign Manganese Ores Contain the Most—Potash in the Burden of American Furnaces

BY N. H. GELLERT*

THE iron ores that are ordinarily used in blast furnaces in the United States contain potash. Some of the analyses made on raw materials used in the manufacture of pig iron, spiegeleisen and ferromanganese have shown the following:

Analyses of Raw Materials Used in Blast Furnaces, Showing Potash Value

Kind of Ore	Iron, Per Cent	Manganese, Per Cent	Silica, Per Cent	Phosphorus, Per Cent	Potash, Per Cent	Moisture, Per Cent	Loss on Ignition Water	
							Zinc	Water
Iron ore	39.80	8.21	18.09	0.114	0.505	11.11		
C ore	35.05	11.10	16.56	0.110	0.570	10.00		
Ferro ore	25.00	20.59	19.79	0.081	0.945	9.30		
B ore					0.490			
C ore					0.580			
Ferro ore					0.978			
A ore	26.00	23.57	16.74	0.118	0.390	4.50		
A ore					0.410			
Cinder	54.25	1.65	18.34	0.880	0.410			
Iron-ton ore					0.290			
Brazilian (Schmidt)	3.60	44.90	7.00	0.15	1.95	9.00		
Indian	6.00	50.85	5.60	0.08	1.84	0.10		
Merritt Lake District	35.20	18.25	15.26	0.05	0.30	8.20		
Brazilian	3.75	39.03	11.50	0.035	2.07	12.30		
Costa Rica	1.90	50.46	9.00	0.042	0.95	0.80		
Glamis Calif.	0.85	40.93	7.10	0.016	1.04	0.50		
Cuban	2.85	39.86	10.50	0.026	0.91	6.50		
Virginia	6.70	39.31	6.75	0.152	1.39	12.00		
Cuban	2.65	40.31	13.95	0.066	0.83	6.00		
Brazilian	10.53	33.83	5.60	0.170	1.00	9.10		
Cuban	4.85	44.85	11.60	0.070	0.85	10.00		

Ore	Iron, Per Cent	Lime, Per Cent	Silica, Per Cent	Magnesia, Per Cent	Ash, Per Cent	Potash, Per Cent	Loss on Ignition Water	
							Zinc	Water
Ore	48.80	1.51	14.20	1.197	1.45	10.00	0.84	
Ore	47.00	...	16.02	0.593	1.54	10.00	0.96	
Limestone	0.25	29.70	2.50	20.57	0.36			

Matter, Per Cent	Vol. Fixed Carbon, Per Cent	Sulphur, Per Cent	Ash, Per Cent	Potash, Per Cent	Moisture, Per Cent	Loss on Ignition Water	
						Zinc	Water
Coke National	0.87	1.50	85.40	1.00	13.10	0.21	1.60
Coke Keystone	0.70	1.35	86.55	1.03	12.10	0.078	2.95

From this table it can readily be seen that the ores used have run from 0.29 per cent total K₂O to 2.07 per cent K₂O. Experience seems to indicate that the ores from the Lake district run low in potash, while foreign ores run high in potash, while the manganese ores of Brazil all run high in K₂O. None of the Brazilian ores which we have used has run below 1 per cent K₂O. Indian ores rank next in potash content. It will be noted that the ores from the Lakes, mentioned as Iron-ton, and the ores from the Merritt Lake district run pretty nearly the same in potash; the content seems to be nearly 3/10 per cent K₂O. It is our belief that most of the ores from this district run around 3/10 per cent potash, but as yet we have not been able to make an extensive survey of the K₂O content of these ores.

One of the remarkable occurrences shown by the analyses which we have made is the high percentage of potash in some of the Brown ores of Alabama. We have secured reports of Alabama ores running as high as 5.10 per cent of potash, but an examination lately made by us for one of our Southern clients developed the fact that even the Brown ores of Alabama may run as high as 1 1/2 per cent K₂O. The gray hematites in this region are known to run between 1 and 3 per cent of potash and while to our knowledge they are not as yet used extensively in blast furnaces, we believe that the time may come when a proper use will be found for them in the manufacture of iron.

Practically all the materials that enter into a blast furnace, with the exception of air, contain potash. The

ores afford the greatest source for this material, although all the rest of the burden adds its quota to the total potash that is usually found in the charge of a blast furnace. Coke which we have analyzed has run as high as 2/10 per cent of K₂O, and as low as 0.078 per cent. Limestone seemed to run between 0.36 and 0.41 per cent K₂O. Richer limestones have been charged in cement kiln operation, but no examination that we have made of raw materials for blast furnaces has included in it this richer limestone.

Potash in a Blast-Furnace Burden

Although the percentages of potash in the burden may vary from a very small amount to a large amount, the total amount of raw materials that are put into a furnace during a 24-hr. operation necessarily makes the daily potash charge an appreciable quantity. The blast furnace is a machine operating on a tremendous scale. The constant charging of raw materials runs the burden tonnage into large daily figures. This large tonnage makes the blast furnace a profitable means of potash manufacture. Tests which we have made at furnace plants and data we have obtained by the examination of raw materials enable us to make available the following table:

Potash Content of Blast Furnace Charges						Potash Charged, Lb.
Series 1	Ore	Limestone	Coke			
1	823,800	343,200	610,000			
2	869,400	359,100	630,000	4,374		
3	877,000	370,500	655,000	4,532		
4	910,800	376,200	665,000	4,589		
5	863,400	359,100	635,000	4,746		
6	841,800	347,700	625,000	4,594		
7	800,400	331,600	587,500			
8	855,600	353,400	620,000			
9	855,600	353,400	620,000			
10	800,400	330,600	580,000			
11	841,800	356,500	610,000	4,613		
12	800,400	339,300	580,000	4,410		
13	533,400	205,500	410,000	2,798		
14	572,800	202,800	425,000	2,853		
15	734,600	263,100	530,000	4,055		
16	505,600	251,100	510,000	3,830		
17	708,000	316,650	616,250			
18	576,000	352,800	497,500			
19	712,000	375,190	545,000	6,374		
20	684,000	419,520	605,000	6,975		
21	648,000	397,440	586,250			
22	672,000	412,160	600,000			
23	708,000	434,240	626,250	7,224		
24	720,000	441,600	637,500	7,500		
Total	18,210,800	8,292,700	14,066,250			
Average	760,033	345,533	583,594			
Series 2						Potash Charged, Lb.
1	257,400	115,500	248,000			
2	249,600	112,000	229,000			
3	257,400	115,500	232,000	4,465		
4	273,000	122,500	235,000	4,700		
5	257,400	115,500	228,000	4,265		
6	249,600	112,000	235,000	4,160		
7	257,400	115,500	200,000	4,245		
8	202,800	91,000	185,000	3,375		
9	250,400	115,500	220,000	3,750		
10	234,000	103,500	200,600	3,435		
11	187,200	78,800	172,000	2,940		
12	241,800	99,200	200,000	3,905		
13	218,400	92,400	210,000	3,565		
Total	3,136,400	1,388,900	2,794,000			
Average	241,262	106,839	214,923	3,619		

Series 3—The following is based on a month's run:

Daily charge:
250 lb. of ore
147 lb. of limestone
147 lb. of sinter
346 lb. of coke

Potash charged per day: 10,380 lb.

Greater and richer charges will obviously result in greater amounts of potash being made available. These amounts make such a considerable total that it is a matter of intense interest to find out what may be the

*President, Gellert Engineering Co., Philadelphia.

future supply of potash in the United States with the blast furnace as a source of supply.

Potash Content of Iron Ores Consumed

The production and consumption of iron ores in the United States is shown in the following table for the years 1889 to 1915, inclusive:

Year	Domestic Ores		Percentage Ratio	
	Produced	Apparent Consumption	Pig Iron Produced	Pig Iron to Iron Ore
1889	14,518,041	14,366,562	7,603,642	52.93
1890	16,036,043	16,302,025	9,202,703	56.45
1891	14,591,175	15,476,989	8,279,870	53.50
1892	16,296,666	16,632,687	9,157,000	57.11
1893	11,587,629	11,616,412	7,124,500	61.33
1894	11,879,679	11,600,393	6,657,388	57.39
1895	15,957,614	17,203,255	9,446,308	54.91
1896	16,005,449	15,765,128	8,623,127	54.70
1897	17,518,046	17,380,184	9,652,680	55.54
1898	19,433,716	20,708,604	11,733,934	56.86
1899	24,683,173	25,513,902	13,620,703	53.39
1900	27,553,161	26,722,583	13,789,242	51.60
1901	28,887,479	29,357,171	15,878,354	54.09
1902	35,554,133	35,886,921	17,821,307	49.66
1903	35,019,308	34,232,339	18,009,252	52.61
1904	27,644,230	30,224,910	16,497,033	54.58
1905	42,526,133	42,433,138	22,992,380	52.94
1906	47,749,728	39,355,343	25,307,191	51.28
1907	51,720,619	51,879,998	25,781,361	49.69
1908	35,983,336	32,473,268	15,936,018	49.74
1909	51,294,271	52,080,428	25,795,471	49.53
1910	57,014,906	55,216,129	27,303,567	49.42
1911	41,092,447	42,245,089	23,649,547	55.98
1912	57,017,614	58,031,118	29,726,937	51.23
1913	59,643,098	61,297,956	30,966,152	50.52
1914	39,714,280	40,613,448	23,332,244	57.45
1915	55,493,100	56,286,058	29,916,213	53.15

It will be noted that over 55,000,000 tons of ore was produced in the United States and that the apparent consumption was over 56,000,000 tons, with a production of 29,000,000 tons of pig iron in 1915. If the minimum content of potash in the ore were three-tenths of 1 per cent, a figure that we have so far found to be a minimum, and not at all an average, then the ore alone would contain yearly 166,479 gross tons of potash. At least an amount equal to two-thirds of this would be charged with the coke and limestone that go into making up the furnace burden. There is, therefore, charged into the blast furnaces of the United States annually about 277,000 tons of potash, making about 305,000 net tons of K.O.

The potash used by the United States yearly is as follows:

	Net Tons		Net Tons
1905	129,084	1910	279,780
1906	155,974	1911	274,446
1907	144,351	1912	253,678
1908	136,057	1913	267,970
1909	173,220	1914	171,798

From this table it may be seen that the average quantity of potash imported was 198,636 tons per year, while the maximum was 279,789 tons. Assuming that this maximum will again be equalled as soon as the potash is available, which we believe is a perfectly safe assumption, it will readily be seen that the blast furnaces can become a decided factor in the supply of a large portion of this necessary commodity.

It has been estimated that between the blast furnaces and cement plants all the potash required for United States consumption can be taken care of by domestic production. The figures given above for the possible potash supply from blast furnaces are based on the lowest potash content found by us in our investigations. That a much larger amount of potash is actually charged into the furnaces of the United States is our belief, as a great many of the ores run higher than three-tenths of 1 per cent.

It is, of course, not possible to recover all the potash charged into a furnace, as there are losses in the slag, and losses by absorption with the brick work, by escape through cinder notches and iron holes, and by escape through the bleeders and through the furnace tops. We believe that between 40 and 50 per cent of the potash charged into a blast furnace can be readily secured by the proper treatment of the charge and by proper collecting devices. The device that can most successfully collect this potash with the greatest saving for blast-furnace operation is the Cottrell electrical precipitator. Experiments conducted by us on a semi-commercial scale indicate that such a collection is possible.

America and the Industrial Reconstitution of Devastated France

The restoration of the invaded section of France and the reconstitution of its industrial life may prove much slower in materializing than the American manufacturer of industrial equipment has been led to expect. It is pointed out in *Commerce Reports* of the U. S. Bureau of Foreign and Domestic Commerce, that first after community life has been re-established, where that is practicable, provisional repairs to and makeshifts of pillaged factories must be made. Restoration of wrecked and flooded coal mines are a prerequisite on account of the small water-power resources of Northern France. This is at least a two years' task.

For fostering agriculture there, admittedly the basis of industry, the French Government is encouraging the formation of co-operative bodies, a step necessary to permit large-scale cultivation with motorized agricultural machinery such as America produces, and an evolution which is forced upon the many holders of small parcels of land characteristic of French farms by the destruction of individual capital and equipment.

Advices from Paris to the Bureau of Foreign and Domestic Commerce state that orders ultimately placed in the United States in connection with reconstruction in France will probably be handled as follows:

They will originate in the Comptoir Central d'Achats Industrielles pour les Regions Envahies (the Government-controlled central purchasing office). It is presumed that representatives of American firms will treat directly with the engineers of this Comptoir, at least in a preliminary way. Orders tentatively approved by the Comptoir Central will be passed on to the so-called Office de Reconstitution. This office was formerly a part of the French Ministry of Blockade and Liberated Regions, but was recently turned over to the newly created Ministry of Industrial Reconstitution. This department was formerly the Ministry of Armament, or Munitions.

When an order for goods to be manufactured in the United States is approved by the Ministry of Industrial Reconstitution it is understood that it will be transmitted by the Franco-American Bureau in Paris, of which M. Andre Tardieu is the chief, to the French High Commission in Washington.

It is pointed out that while industrial capacity in the north of France suffered enormous destruction, there had been a counter-balancing expansion in many lines in the center and southwest of France. This is particularly true of factories, and it is the task of the new Ministry of Industrial Reconstitution to see that these factories are converted to peace use and wherever possible, in order to secure the maximum employment of demobilized French soldiers. It is, therefore, evident that America's part in France will be to supplement French efforts; primarily to supply these plants with raw materials not produced there; secondly, to supply those products which cannot now be economically manufactured in France. The bulk of the work of reconstitution, it appears, can be done only by the French themselves.

The Commonwealth Silica Co., Ottawa, Ill., producer of sand for iron and steel manufacturing purposes, has just purchased the entire property of the Ottawa Steel Molding Sand Co., comprising 84 acres of "Buffalo Rock" land and all equipment. Before this purchase the company owned 240 acres, with a claimed silica content of 97½ per cent. Two railroads traverse the property and the Illinois River is adjacent, enabling the inauguration last year of a fleet of barges between Buffalo Rock and St. Louis. With the completion of the deep waterway to Joliet a large Eastern demand is expected. The Buffalo Rock is one of 17 sand deposits in the United States and Canada suitable for iron and steel manufacture.

The Ferrell-Wight Co., Albany, Ga., has recently been organized and incorporated with a capital of \$25,000 and will operate a wholesale automobile accessory business.

New Method of Screw-Thread Inspection

Machine for Optical Projection Presents Improvements Over Gage Testing—Thread Surface Condition Accurately Revealed

BY JAMES HARTNESS*

THE advancement in the development of the bicycle, the automobile and airplane has reached a point in which it is absolutely necessary to inspect screws in a way that will give a much better indication of their dependability. Before the art had advanced to this point where it was necessary to obtain the greatest strength for a given weight a simpler system of gaging was satisfactory, but now, to make the most dependable airplane, a screw thread should be gaged for form, diameter, pitch, roundness, and compactness of surface. The gaging should be done with full consideration of the changes that are produced in the lead, form and diameter when subjected to the working stress.

It seems probable that with the advance of requirements in machine construction we must go a step further in our gaging methods and make use of the projection lantern to help us solve our screw-thread gaging problems. The optical method of inspection and measurement of screw threads by the use of microscopic apparatus and projection lantern has been found invaluable in inspecting gages, but it has not been generally used for the inspection of the work itself.

The tactile or touch method of inspection does not give us a true indication of the form of a screw, and even with a variety of instruments it gives only an approximate conception of the lead.

Notwithstanding the shortcomings of the ring and caliper types of gages, they still remain among the most practical gages in the workman's hands; and although the projection lantern brings the gaging to a definite science, and should be the basis of specifications for screw threads, and the final arbiter in accepting or rejecting the product, its function is more to keep a check on the simpler forms of gages than to supplant them.

For instance, the first and last pieces of a lot of die-cut screws should be tested by the lantern. A change of dies, either through wear or important adjustment, should be checked by sending a sample screw to the lantern. This, supplemented by the percentage test of the final product, would be sufficient check, for it would give a definite knowledge of the character of the form, lead, roundness, etc.

The projection lantern has been developed to a point where it now gives at a glance the diameter, lead, form, and a fair indication of the roundness and smoothness of the surfaces. In order to get all of these results

it is necessary to use in connection with the projection apparatus, a stage and tolerance chart laid out on a large scale to conform to the desired characteristics of the screw to be inspected.

The chart is so located that the profile of one or more threads of the screw may be projected upon the chart and a comparison made between the enlarged shadow thus cast by the thread and the form of thread and tolerances outlined on the chart.

The advantage of the projection method is that it

is possible to see at a glance how a screw will fit in its threaded hole as represented by the tolerance chart on the screen. If only one thread is projected on the screen, this is raised or lowered by variation in diameter and displaced laterally by variation in lead. The combination of these two things must be known in order to know how the screw will fit into the threaded hole. If two threads are projected, we have a knowledge of the parallelism or taper of a screw.

By the use of the projection apparatus

and the tolerance chart, all elements excepting the density of surface may be seen at a glance. The resultant effect of the displacement in lead, diameter and angle to the boundaries established on the tolerance chart indicates the fit with a definiteness that will be beneficial alike to the producer and the purchaser, for it will make it possible for the purchaser to express in words and by diagram the exact boundaries within which the product must come.

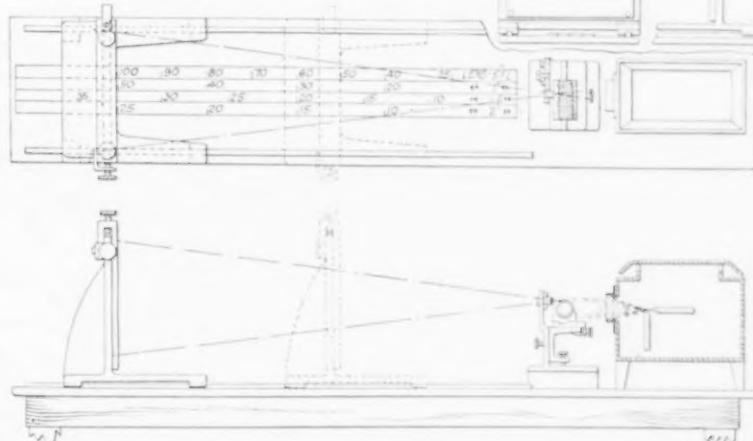
In addition to providing a measure for the lead and diameter the tolerance chart and projection apparatus provide a way by which it is possible to indicate the extent of variation in the form of the thread that will be tolerated.

As the art of machine building advances and our methods for producing and gaging screw threads advance, we shall doubtless soon arrive at a point at which we will find it desirable to indicate the difference in lead between the two component parts of a screw-thread fit. For instance, stress of work on a bolt or nut tends to lengthen the screw and compress the nut, so that if the leads of the thread in the screw and the nut were equal when free from stress, there would be an unequal distribution of the load on the various threads engaged when the two members were under a heavy stress.

The stress on a set screw compresses the screw, and to get equal distribution of load on each thread the set screw should be long in lead when free from stress, and the lead of the bolt and nut should be longer in the nut than in the bolt.

To meet such demands the projection-lantern scheme furnishes a solution of one-half of the problem, for

DIAGRAM SHOWING ESSENTIAL PARTS OF PROJECTION APPARATUS



*From a paper, "Optical Projection for Screw-Thread Inspection," appearing in the February issue of Mechanical Engineering, formerly the Journal of the American Society of Mechanical Engineers. The author is president, Jones & Lassen Machine Co., and vice-president, National Screw-Thread Commission.

gaging is half of producing the work. If we have a practical and ready method of gaging, it is much easier to produce the work. By the use of the projection apparatus the specifications may call for cap screws showing the displacement due to lead in one direction, and set screws in the opposite direction.

Measurement of Internal Threads

While the projection apparatus does not provide a solution for the measurement of the internal thread, it does provide means for measuring the tap which is used for producing the internal thread, and although it is well known that the usual way of measuring a tap does not indicate the exact nature of the threaded hole that will be produced by that tap, it is probable that a complete inspection of the tap by the projection methods will bring a closer harmony between the measurements of the tap and the threaded hole produced by it.

Furthermore, the advance of machine construction has demanded for a number of years a greater refinement in tap making, and although the most progressive companies in this work have shown a remarkable advance in this respect we are undoubtedly coming to a time when taps will be lapped or ground after hardening to bring them into greater uniformity.

Thus it seems that the advent of the projection lantern into the workshop for testing a certain percentage of the work produced will result in making our airplanes and other machines which operate under great tension for given dimensions

more dependable and more efficient, and at the same time get a greater return for the energy that is put forth in the workshop in producing these things, for no one thing has been a greater barrier to our progress, especially in our recent war activities, than the uncertainty in our methods of specifying, producing and testing screw threads.

Description of Projection Apparatus and Chart

The apparatus consists of three principal elements: the machine, which holds the work and lens; the lamp house; and the chart holder, which serves as a screen on which the profile of the thread is projected. The chart holder slides on rails to and from the work in order to get the desired number of magnifications.

The general plan of operation starts with positioning the work and adjusting the light, work, lens and chart so that the image of a perfect screw thread will fall on the chart along certain lines. When we have no sample of work on which the thread is known to be satisfactory a standard screw-thread plug may be put in the work holder and used for setting the chart. After that the work may be placed in the machine, one piece after another, and instantly its shadow will reveal its diameter, lead error and profile. If these fall within a certain range of tolerance on the chart the work is acceptable.

The simplest method of screw inspection projects the profile of one thread on a chart that has a maximum and minimum boundary. The maximum boundary represents the outline of the thread of the hole into which the screw must fit and the minimum represents the smallest acceptable diameter.

Tolerance Chart

The exact form of the chart will vary with different requirements, but I prefer a chart on which the boundaries indicated have stated gradations. For instance, for a screw thread of 10 pitch at 200 magnifications the outline of the thread form measures 20 in. between centers of crests of thread, and I produce a chart by

drawing these forms in light pencil marks, in steps spaced at 0.8 in., which amounts to 0.004 in. variation of screw thread, for at 200 magnifications we have 0.2 in. per thousandth of an inch.

Inasmuch as it is not easy to locate the shadow in relation to straight lines, I use black dots having a vertical width of 0.8 in., which amounts to approximately a width of $\frac{1}{8}$ in. on the flanks of the thread. These dots are made of different lengths, so they may be readily recognized in the partial light of the projection room. The light of the projection room should be adjusted to see the black dots, even in the shadow, and yet not too light to dim the shadow.

By numbering the lines of the charts from 1 to 6, beginning at the upper and running to the lower side, we have means for recording, if necessary, the measurements of a screw. For this purpose we would set up the instrument with a standard plug gage or other perfect thread so that the shadow of this perfect thread would fall on line 5, and this would constitute the largest size that would be tolerated for free fits, the plug being the basic diameter.

Let us assume that the allowable tolerance at the pitch diameter of a 10-pitch screw is 0.008 in.; that is, that the screw may be up to the full basic standard line No. 5, or it may be 0.008 in. smaller, in which case the shadow should not proceed farther than line No. 3. Then by placing one piece of work after another in the holder, if the shadow falls within these boundaries of 3 to 5, we know its size is acceptable. If its shadow falls below line No. 5 toward No. 6, it is too large for that grade of fit.

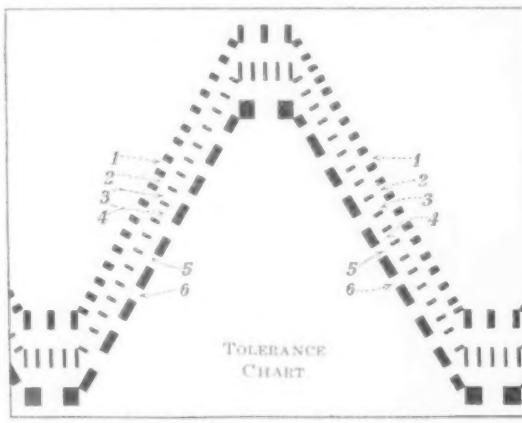
The average run of work with the projection lantern will present some new thoughts to the inspector's mind. He will see that the lead is not uniform. In the length of a 3-in. screw the lead at one end of the screw may be shorter than at the other end. He will find that many screws are not round, and some are very irregular and mountainous on the surface; not that these elements have been created by the projection apparatus, but merely that they have been brought clearly to view and should be recognized by any system of gaging that has for its ultimate purpose determining the dependability of the screw.

Rotating the work in its holder brings out irregularities. If the screw is of good form its shadow will remain stationary on the chart. If the thread is drunken, out of round, or very irregular, the shadow will move. A ragged surface also appears in the unevenness of the line, and frequently the inspector is confronted with the necessity of determining what part of the line he is to designate as indicating the real working diameter of the screw.

It is not unusual to find one of the flanks of the thread, instead of presenting a straight profile, shows for instance, a ridge near where the crest of the thread is rotated.

This condition has always existed in screw threads, and it is for us to recognize that the projection method merely shows how deceptive has been the gaging system which depended on the tactile sense or sense of feel of the gage. In gaging, this ridge would play an important part in eliminating shake, and yet the screw might be under size so far as its holding capacity is concerned.

An interesting book, called "The Road to Peace," has been issued by the Lakewood Engineering Co., Cleveland. It portrays in 19 half-tones, each 6 x 9 in. the company's military portable track leaving the factory, en route, delivered, and in use at the front in France. A page opposite each illustration is devoted to text on engineering progress, instrumental in furthering peace.



War Department Warns Against Fraud

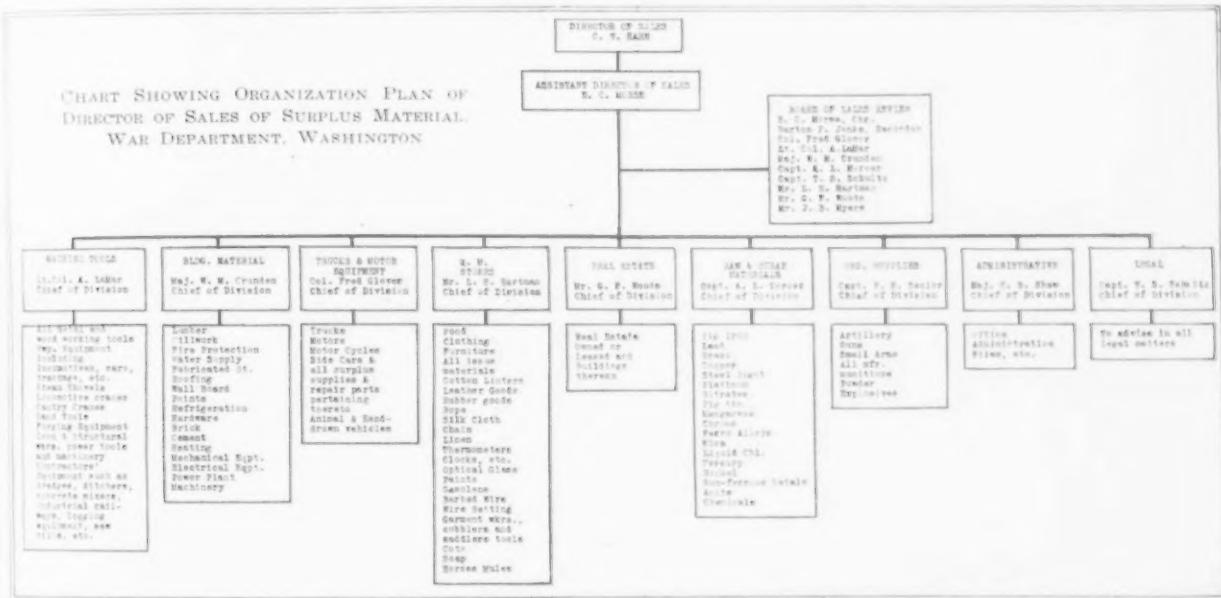
Attempts to Defraud in Connection with Disposing of Surplus Material—Tonnage of Scrap on Hand Is Far Below Estimates

WASHINGTON, Feb. 4.—The most important development of the week in the War Department's disposition of surplus material was the discovery that a reported accumulation of scrap materials in the Ordnance Department of 20,000,000,000 lb. had vanished to a point of less than 90,000,000 lb.

The office of the Director of Sales, which is making up inventories of all surplus materials on hand as the first step in their disposition, has found considerable trouble in the fact that irresponsible rumors are reporting all kinds of fantastic figures of amounts and values. But the report that Uncle Sam had a junk pile of scrap that would weigh 20,000,000,000 lb. seemed the most fantastic. So orders were given to hasten the inventory of the scrap actually on hand in the Ordnance Department. When it was all made up it totaled 88,352,324 lb.,

necessary to issue warnings against efforts of unscrupulous persons to do a second-hand business with Government property which they have not even bought. C. W. Hare, Director of Sales, insists that he will carry out to the letter his policy of not permitting the Government's accumulation of surplus material to interfere with normal markets. The various sections of his office are still at work to turn back to manufacturers as far as possible the material which cannot be absorbed by other Government departments.

A number of instances, however, occurred to show that outsiders are trying to take advantage of untrue rumors. A notorious instance happened in Washington last week. The local agency of a big automobile tire concern called up the War Department to complain because it had been offered a big consignment of its own



which would represent an estimated value of somewhere in the neighborhood of \$1,500,000. The details of this inventory follow:

	Pounds
Aluminum scrap, all kinds.	46,608
Brass scrap, all kinds.	5,842,351
Cupro-nickel, all kinds.	781,392
Copper.	691,580
Machine shop borings and turnings.	9,714,139
Steel, heavy melting.	20,771,061
Steel, low phosphorus.	5,988,477
Nickel steel heavy melting.	5,518,359
Nickel steel borings and turnings.	15,634,919
Cast and malleable iron.	13,692,718
High speed borings, turnings, scrap tools.	63,365
Mixed and miscellaneous iron and steel scrap.	5,195,748
Miscellaneous scrap, consisting of rags, waste paper, etc.	803,956
Lead dress scrap.	153,005
Lead scrap.	322,355
Brass ashes and sweepings.	1,067,571
Burlap.	256,063
Spent acid.	1,495,250
Amatol.	269,847
Ammonium picrate.	5,000
Tetryl.	18,660
Total.	88,352,324

The disposition of this scrap is being handled by a special scrap section of the office of the Director of Sales in the open market and as far as possible is being disposed of at the points where it is accumulated and at the local market values. The officials in charge say that there is not enough in any one place seriously to demoralize the scrap market. Where there would be such danger they say every precaution will be taken to avoid breaking the market.

At the same time the War Department has found it

tires. A broker had attempted to force the tire company to put a high price on the repurchase of 10,000 casings, alleged to have been bought from the Government, under the threat that they would otherwise be distributed to the selling agencies of this company throughout the country at cut price figures. As the tire concern had an agreement with the War Department to reabsorb all its own tires, this looked like a crass violation of the Government's word.

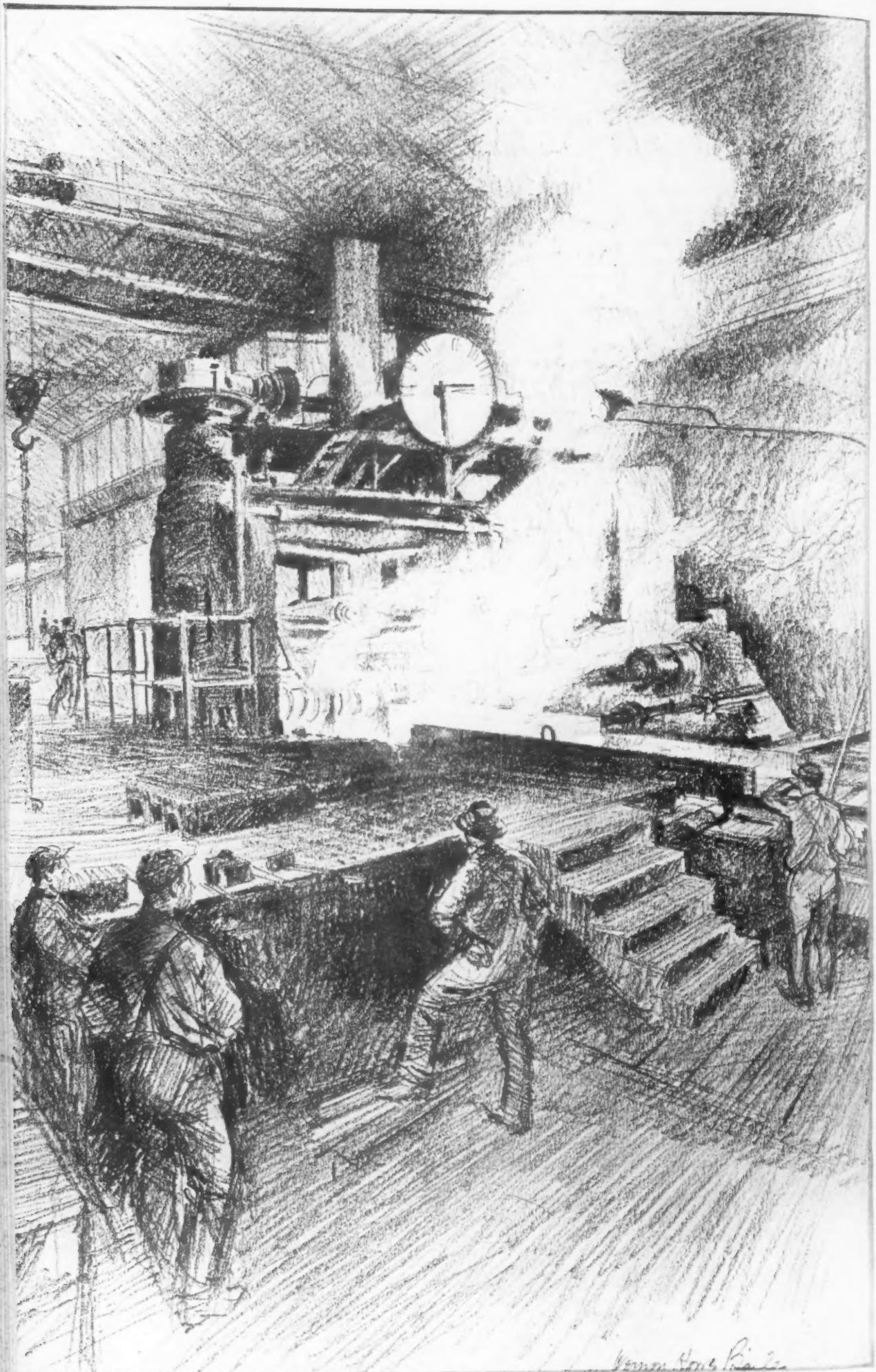
Investigation, however, showed that the broker in question did not have the 10,000 tires and had not even attempted to buy them. He admitted to the Government that he merely wanted to get a price from the tire company after which he would offer the Government a lower price and make his profit out of the difference.

To prevent further blackmail of this kind, E. C. Morse, Assistant Director of Sales, gave out the following announcement for the department:

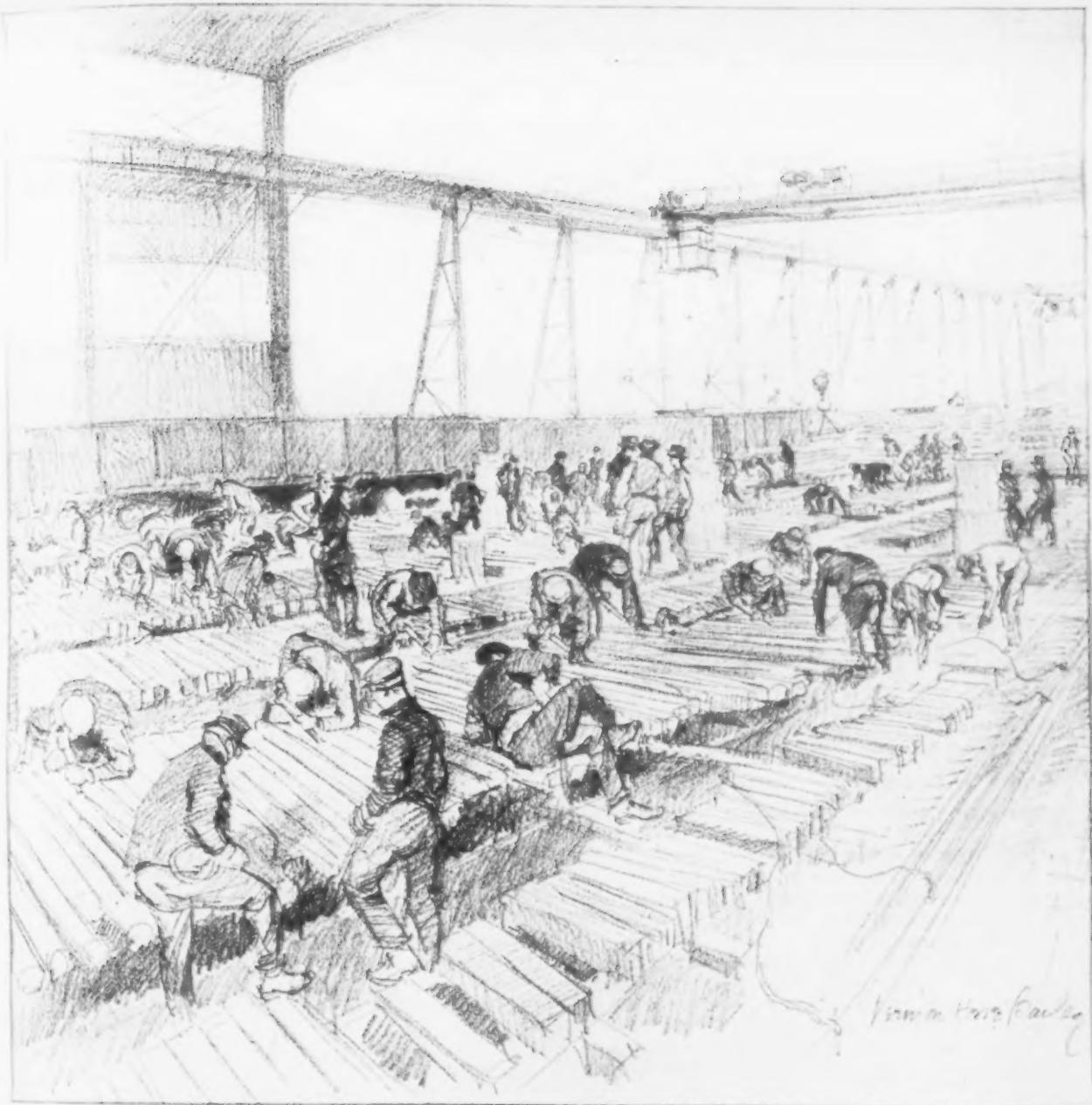
"It has been noted that a number of second-hand dealers advertise, from time to time, quantities of new or nearly new material, which they claim to have purchased from the Government and on which they solicit business.

"These cases have all been run down, and in every instance so far material advertised has not been the property of the second-hand dealer, and the Government had no intention of selling him this property.

"The trade should distinctly understand that it is not the policy of the Sales Department to sell property to anyone for speculative purposes.



Seven-Tone Piano



THE views here shown are photographic reproductions of drawings in black and white made for the Interstate Iron & Steel Company, Chicago, by Vernon Howe Bailey. The one on the facing page shows the 35-in. blooming mill at South Chicago in operation. The view above shows chipping and preparation for shipment of alloy steel billets at the South Chicago works. The chipping, which is done with pneumatic hammers, is of course to insure clean re-rolling of the steel, which is intended for automobile and truck and tractor industries.

Reducing the Cost of Disability

Rehabilitation Restores and May Enhance
Earning Capacity—Insurance Costs Lessened
—The Economy of Liberal Medical Attention

BY DOUGLAS C. MC MURTRIE*

In the past, the method in this country of dealing with men permanently disabled in the course of employment has been to pay the worker compensation, and forget him and his injury. But the cost of disability to the iron industry has not been alone in premiums paid for casualty insurance. There has been the cost involved in training, experience, and adaptation of a skilled worker who does not return to his job, and the fitting of a newcomer to take his place.

There are three means of reducing and approaching the complete elimination of the cost of disability: First, accident prevention; second, thorough medical attention to minimize the disability resulting from the injury; and, third, salvage of the remaining abilities of the worker through rehabilitation for self-support. The first of these has already received wide attention from employers and has wisely been encouraged in a financial way by casualty insurance companies and State funds. The values of the two latter have, however, not as yet been appreciated. Their energetic application would effect a tremendous saving to industry.

Economy of Liberal Policy Toward Medical Attention

Many injuries from which men would completely recover in a short time under adequate and high grade medical attention are treated for an insufficient time, or by incompetent physicians and, instead of a prompt return to work, the case at best drags along over an extended period and at worst becomes chronic or develops into permanent disability. Some States require the insurance carrier to provide but two weeks of compulsory free medical attention to the injured man. For the insurance company to take advantage of this limitation is the most short-sighted policy possible, because for every dollar saved in physicians' or hospital fees, the insurance carrier pays out later \$10 in compensation. And what the insurance company pays is actually paid by the insuring employers in their regular premiums.

Unlimited medical attention of the highest grade should be an axiom for casualty practice. It should be insisted upon by employer and workman alike. The best outcome of any injury is to have the employee return to his job as a well man in the shortest possible time. It is well to develop a science of dealing with cripples, but the ideal is to have fewer and fewer cripples with whom to deal.

The third method of attack on the cost of disability is rehabilitation for self-support—the re-education of an injured man for an occupation which he can follow, or a process which he can perform, in spite of his handicap. The science of rehabilitation is new, and the experience in it has practically all been gained in the effort to make sound and just provision for the disabled soldier or sailor. Every country among the recent belligerents is to-day operating a comprehensive system of re-education for disabled soldiers, and is placing upon that system more dependence than upon the pension system.

Rehabilitation Instead of Compensation

Paying a man a small monthly or weekly stipend on which he is expected to live in idleness is not a very constructive method. With the breakdown of confidence in the pension system, it was realized that the only real compensation for disablement was restoration of capacity for self-support. It was further realized that very few jobs require all the physical faculties and that in

the present day variety of industrial processes, it is possible to find a job in which a man with a given type of disability can function 100 per cent efficient. Some jobs are standing, some seated, others require walking about, some jobs at a bench, working on small articles, require but little strength, others involve great physical exertion. Still others do not require the sense of hearing, in others the sense of sight is not essential. Finding the future work of the disabled man, therefore, requires expert and painstaking choice, but a successful selection is possible even for the seriously handicapped. The first aim is to place the man back in a different job in his own trade or in a trade closely related. In such a job his past experience will stand him in good stead. Failing this, he can be re-trained for a different line.

Function of the Red Cross Institute

The process of re-training the disabled is known as re-education, and can best be provided in a special school for crippled men. The first school of this kind in the United States is the Red Cross Institute for Crippled and Disabled Men, established in New York through the generosity of Jeremiah Milbank. At this school, open to disabled civilians and soldiers alike, six trades are already being taught: Artificial limb making, motion picture operating, oxyacetylene welding, printing, jewelry work, and mechanical drafting. More will be added as the demand develops. Graduates are already giving satisfaction in the jobs to which they have been graduated, so the enterprise has passed the experimental stage. And in the results attained with disabled soldiers abroad there is overwhelming evidence of the logic and practicability of rehabilitation.

The cost of soldier rehabilitation is being met by the United States Government and by the Governments of some of our Allies. It will be admitted without argument as desirable that the advantages of re-education be made available to disabled civilians as well, but will not the cost be prohibitive? The fact is that rehabilitation effects a reduction rather than an increase in the cost of disability to industry or to the community as a whole.

Lowering the Cost of Injuries

A typical case will illustrate how the saving is effected. A worker in Massachusetts was injured by a fall while working inside a submarine and his hand became permanently crippled. In due course his compensation rate was determined and he was referred to the insurance carrier to be paid \$10 a week for a long period, with a maximum total payment of \$4,000. Since the disability was manifestly permanent, the insurance company wrote the case off their books as a \$4,000 loss and transferred that amount to reserve to cover the weekly payments. After the compensation had been paid for nearly a year, a new official of the insurance company began looking over the list of men to whom the company was paying compensation. His attention was directed to the man in question, and the latter was requested to call at the office of the company. The case was, like many thousands of others, susceptible of rehabilitation for self-support, so the insurance company official put a proposition to the man in very frank terms: "I believe that you can be trained to earn a good living. I want you to understand, very clearly, however, that this proposal is to the financial advantage of the company, but I also believe it is to your advantage as well. A total income of \$10 a week is not very attractive to you and you would probably rather return to work at a good wage than remain idle. If you will consent, the company will send you to a

*Director, Red Cross Institute for Crippled and Disabled Men, Twenty-third Street and Fourth Avenue, New York

school of re-education and see if we cannot get you back on your feet in good shape."

The injured man consented to the proposal and the company sent him to the Red Cross Institute in New York. The company began to pay him not \$10 a week as required by law; but \$40 a week, \$20 to him in New York and \$20 to his wife at home. The company also paid liberally his traveling expenses in both directions. In the period of eight weeks, he was re-educated in oxy-acetylene cutting and welding and returned home. He is now making not only a satisfactory wage, but twice as much as he had ever earned before the accident took place.

Workers' Increased Earning Capacity

In the whole transaction every party of interest was benefited. The man was advantaged in that his general living standard was distinctly raised, and the necessity of working for his living could not be considered as a hardship. The company paid less than \$500 for his rehabilitation and this expense, in conjunction with the \$500 already paid in weekly compensation during the first year of idleness, made a total for the case of \$1,000. They were thus enabled to charge \$3,000 of profit to the account of profit and loss. The community was infinitely the gainer in that the man, formerly an unproductive consumer, became a useful producer instead. The community further gained in the elimination of the disabled man from the category of a prospective dependent, because while compensation

might have taken care of him in a very insufficient way during the period of idleness, there would have come a time when compensation ceased and then he would have been in a desperate economic status indeed—confirmed in habits of idleness, untrained for skilled work, and without any source of support.

A more intelligent handling of disability by insurance carriers will, therefore, reduce their expense, and will thus cut the cost of casualty protection to the employer. There is needed also, however, some revision of compensation laws so that there may be definite encouragement to insurance carriers to offer opportunity of rehabilitation and definite encouragement to the disabled men to take advantage of it. Practically every compensation case that has ever come to the Red Cross Institute has come on the day his compensation expired. For one year, for two years, or for four years, the man has existed in idleness, drawing compensation, and cultivating habits of indolence. When his support was cut off, he then became interested in rehabilitation. Present compensation legislation tends to encourage the man to remain idle because his payments are reduced by an improvement in earning capacity. A revision of this practice will make for more constructive provision.

In short, the first effort should be to prevent injury, the second to minimize its permanent effects, the third—when disability has ensued—to offset its economic consequences. The execution of this complete program is not only sound humanitarian practice—it is good business as well.

Canadian Manufacturers Organizing for Belgian Reconstruction

In order to impress upon Canadian manufacturers the necessity for organizing into trade groups, to be ready to compete for a share of the work of rebuilding Europe, the intelligence department of the Canadian Manufacturers' Association is issuing a circular calling for concerted action. Manufacturers, it is pointed out, must be prepared to turn out standardized products in quantity. A condensed list is given of immediate requirements for a part of Belgium only, including:

Copper, sheets, bars and ingots, 39,000 tons; brass, sheets and tubes, 3500 tons; machine tools, 60,000 tons; hawsers, steel cables, belting, electric power plant, for military requirements; pig iron, 1,012,050 tons; iron and steel, worked and semi-worked, 825,000 tons; transportation material for railroads, locomotives, trucks, etc.; automobile transportation material, trucks, trailers, cars; depot material, turntables, forges, pits, drilling machines, jacks, etc.; crushers, mixers, hoists, cranes, bridges, locks, etc.; pontoons, chain and accessories; dredging equipment, dredges, tugs, sand carriers, lighters; pumps, compressors, tugs; road scrapers, graders, rollers, boilers, engines, pumps, steam shovels; small tools, shovels, picks, mattocks, etc.; railroad construction material, rails and accessories, tools, machine tools, motors, signalling apparatus.

Agricultural Machinery.—Plows, single, 40,000 tons; plows, two or more shares, 20,000 tons; skimmers, scarifiers and cultivators, 20,000 tons; harrows, 75,000 tons; ordinary rollers, 20,000 tons; disk rollers, 10,000 tons; horse hoes, 10,000 tons; potato plows, 10,000 tons; seed drills, 2000 tons; horse rakes, 2000 tons; winnowing machines, 50,000 tons; root cutters, 10,000 tons; chaffers, 15,000 tons; churns, 50,000 tons; carts and vans, 100,000 tons.

There is also a good demand for stoves of the plain, light type, suitable for bituminous or anthracite, knock-down form, standard size; also plain, strong cooking stoves, cheap and durable.

"Innovations in the Metallurgy of Lead" is the title of Bulletin 157 of the U. S. Bureau of Mines, written by Dorsey A. Lyon and Oliver C. Ralston. The data included are largely the result of experiments conducted at the Salt Lake City station of the Bureau of Mines in co-operation with the department of metallurgical research of the University of Utah.

No Special Rates on Goods Shipped in Steel Containers

WASHINGTON, Feb. 4.—The Interstate Commerce Commission has refused to order the railroads of the country to quote special freight rates on goods shipped in steel containers. The decision was announced in the case of the Pneumatic Scales Corporation, Ltd.—the manufacturer of such containers—which had complained that the present rates charged on their return movement were "unjust, unreasonable, unjustly discriminatory and unduly prejudicial," and that the railroad companies should make special allowances for the return shipment of these containers.

In its statement to the commission the complaining manufacturer declared that out of the loss-and-damage bill of \$50,000,000 which the railroads had to pay in 1917 the general use of this container would have saved the carriers \$10,000,000. To this the railroads demurred, declaring that the saving would have been less than \$1,500,000. On the other hand, the complainant estimated that the loss in revenue under the revised rates asked for such shipments would be \$5,800,000, while the railroads figured it at \$41,000,000. To offset some of this the complainant estimated that the grant of special rates on the returned movement of its containers, collapsed, would give the railroads \$8,000,000 a year in new revenue, while the railroad companies insisted that whatever the new revenue, it would be too low to produce a profit.

A decrease in the number of industrial accidents, but an increase in the total benefits paid under the Wisconsin workmen's compensation act during the 1917-1918 period, compared with the previous year, is shown by a special report issued by the Industrial Commission of Wisconsin for the year ending June 30, 1918. The total benefits paid were \$1,705,468, of which \$1,276,388 was for indemnity and \$427,085 for medical attention. A total of 19,361 cases was reported, compared with 20,560 cases for the previous year; the total cases settled, 15,825, against 17,157. The increase in indemnity in spite of a decrease in number of cases is due to a general increase in compensation rates made by amendments to the compensation act in 1917.

The Coe-Stapley Mfg. Co., formerly at 135 Broadway, New York, announces the change of its address to 136 Liberty Street.

Would Permit Business Men to Co-operate

John Franklin Fort, Member Federal Trade Commission,
Suggests Plan to Allow Associations for Domestic Trade
Similar to Those Permitted by Webb Act for Export Business

WASHINGTON, Feb. 4.—American industry shows little indication of a growing interest in the opportunities for organization for foreign trade offered by the Webb law. Even the Consolidated Steel Co., organized in December to take care of the export interests of the independent steel companies, has not yet filed its charter with the Federal Trade Commission, as required by the act.

Much of the difficulty lies in the uncertainty concerning the Webb law itself. So far, no definite recommendations have been made, either by the Federal Trade Commission, the Department of Justice, or the Department of Commerce. Nor is there the slightest possibility that Congress will take up the question.

John Franklin Fort, a member of the Federal Trade Commission, however, went to New York last week to tell the New York Credit Men's Association something in detail of what the commission thinks ought to be done to make use of the law. He even advocated amending the Sherman law to permit similar business—but under Federal Trade Commission supervision.

Webb Act and Good Faith

"The Webb export act is supposed to be a help to foreign trade, but if it is not properly cared for or guarded it may become an injury," declared Mr. Fort. "Good faith in foreign dealings will be essential to success under that act. The great problem will be to see that our merchants do not use unfair methods in attempting to sell American goods abroad. It would be very easy to make misrepresentations and improper invoicing, which might injure rather than help our foreign trade. Our business men must hold very high ideals in all they do. There is just a little feeling at present in certain countries, with which I have become familiar through communications which have been sent to the State Department, that the United States is forming associations under the Webb act which may be used to relieve responsibilities under the Sherman act, and thereby put our trade in a position which it is not required to observe at home under the Sherman act.

"Of course this is not the case, and the Webb act had no such purpose, but it is not difficult to make persons abroad believe that we keep the Sherman act in force for home protection and do not apply it to foreign trade; that there is some motive to cause us to make a difference between home regulation and foreign. One statement puts it that we do not allow the trusts to operate here, but we do allow them to operate abroad."

Mr. Fort then laid down the following principles, which he said the business men of the country must bear in mind:

That they must meet conditions which are seemingly necessary in foreign trade. The packing of our goods by American business men must be in such manner that it will be satisfactory to and conform with the requirements of the countries to which they are shipped. Much care is needed for preparing the goods for shipment to foreign ports, and it would seem that business men of the country should have established or themselves establish some methods of instructing shippers along this line.

That there must be no shipment of goods sold on sample where the goods do not absolutely and in perfect good faith comply with the sample upon which they are sold.

That there should be no similarity in the name of various shippers, or associations of shippers, by which it would be possible to cause unfair methods of competition between shippers at home or abroad in any shipments in foreign commerce by which there may be a holding out of one man's goods for another's.

American manufacturers and exporters should avoid the "dumping" of American goods in foreign markets.

American exporters should refrain from taking advantage of export trade to influence or manipulate domestic prices.

"It has come to light lately, by reports of consuls forwarded through the State Department," continued Mr. Fort, "that foreigners are organizing American corporations under the Webb export act that are really not American-owned corporations, in fact, at all. These corporations, having an American name, though not being American in fact, could, if they so wished (let us hope they will not), injure our American business men by sending goods which may be of inferior quality or less value than represented to the injury of our trade. American trade must be kept absolutely clean if it is going to gain and hold additional export volume. Supervision will have to be exercised along these lines to see that all goods we export are as they should be, otherwise great injury may result to the reputation of persons shipping in foreign trade from this country.

Power of Federal Trade Commission

"Under the export trade act it is within the power of the Federal Trade Commission to meet conditions, where they are unfair, and if the facts are brought to the attention of the Federal Trade Commission they will do so. The business men of the country should see to it that if there are any unfair methods used they should get these methods to its attention.

"The American business man engaged in foreign commerce is on trial to-day more than he ever has been. All the integrity and tact which he possesses should be utilized in the interest of increasing trade and strengthening his standing as a world business man. It would be very easy, by exercising shrewd or unfair methods or ingenious schemes, to break this trade down rather than build it up. If honor is practiced in conducting foreign business, the growth of the export business will greatly increase and help to stabilize American industry along all lines."

In discussing the need for modifying the Sherman law to permit greater industrial and business co-operation at home, Mr. Fort said:

"For almost 30 years the Sherman Act has been enforced, and while under it much has been done, it has been largely from fear of business men of their ability to observe it that business has been more or less hampered, even among honest merchants. The actual force of the Sherman act has been of difficult understanding, and business men have never felt really sure of where they stood under the act, and what they could or could not do. It is unquestionably true that the Supreme Court doctrine that this act must be construed in the light of reason has greatly helped the situation, but even that is still left in what might be called a twilight zone as to what can and what cannot be done under this act.

Co-operative Organizations

"The country should be relieved from any controversy about conducting it in such a way as to endanger the suffering of some penalty which the business man did not expect in organizing and carrying on the trade in which he was engaged. We have reached a time when there must be absolute freedom in conducting business along lines that are known not to be a violation of any law. No man can conduct business comfortably and feel that there is all the time more or less liability that he will be brought up for some violation of the law. There must be some method devised by which merchants engaged in competition in any line can have some understanding without fearing imprisonment. It begins to look now as if co-operative organizations or associations similar to those under the export act should be allowed among business men. Co-operation seems to be one of the apparent solutions, but co-operation must be regulated so that when a conclusion is reached

those in co-operation will understand perfectly whether they are or are not violating any law.

"We are perfectly protected under the Federal Trade Commission act and the Clayton act against any unfair methods of trade, and they can be stopped without difficulty. Price fixing seems to be inhibited by law under the decisions of our courts. Apparently, the mere gathering together for the purpose of fixing prices, or even conferring about prices, seems to be held unlawful. If co-operation could occur, and business men in different lines were permitted to gather and agree upon a method of arriving at a fair price, under some government regulation and approval, and this could be put in operation, I do not believe that it would injure the consumer, and certainly would prevent any trouble arising under regulation of fair and just prices.

"If co-operative organizations in any industry were allowed to confer together and agree upon what they thought would be a fair price for their goods, and they were then to submit that price to the Federal Trade Commission or some other agency, and that commission were then to determine by investigation what was their cost to manufacture, and whether the price they asked was a reasonable one, and that commission should, after thus investigating, determine that the price was fair, then let such a price be fixed, subject to revision, if you will, if complaints were made afterward as to its reasonableness; then the business men would know that they could be safe from prosecution so long as that price was honestly lived up to, and stood. Of course, this price should be a maximum one, so that no merchant could sell above it, while any one who wished could sell below it. It has been said that the maximum price thus fixed will become the minimum price in the industry, but I do not believe that this statement is true. It would leave competition open and free at any price below the maximum, but under the fifth section of the Federal Trade Commission act if the price of sale below the maximum were so greatly reduced by any one in the industry as to amount to cutting below a reasonable and fair price, or below cost, it could be prevented by the Federal Trade Commission as unfair to competitors. This would be honest to everybody. It would be open to the public, and on complaint could be revised at any time when any price fixed was found to work injustice to business interests.

Violation of Agreement

"Then it could be provided that any one wilfully violating this agreement could be prosecuted under the Sherman act, as at present. This would have two effects: (1) It would relieve business men from doubt; and (2) it would make the enforcement of the Sherman act, where wrong and injustice were done, easy of successful prosecution for the violation of the act."

Among the newer export organizations which have filed their charters under the Webb law are the following:

Allied Mfg. Export Corporation, 60 South Street, Boston.
Dolster Miners' Supply Co., Fort Wayne, Ind.

Franklin International Corporation, 958 Hoe Avenue, New York.

Maxim Munitions Corporation, 120 Broadway, New York.
Pearson Export Corporation, 170 Broadway, New York.
Portuguese-American Exporters (Inc.), 120 Broadway, New York.

Strong & Trowbridge Co., 17 Battery Place, New York.
United States Office Equipment Export Association, care of Globe-Wernicke Co., Cincinnati.

On the general question of "trust legislation" the Chamber of Commerce of the United States has undertaken a referendum of its members. The four questions are comprised in the following:

"Shall the members of the chamber sustain the recommendation of a special committee that

"Congress should at once consider the situation of all statutes constituting our anti-trust legislation;

"There should be formulated standards of general business conduct to be administered by a supervisory body;

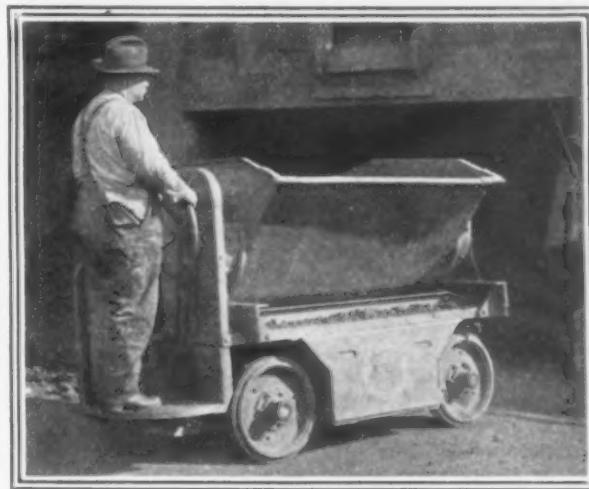
"An enlarged Federal Trade Commission should be made the supervisory body;

"The membership of the Federal Trade Commission should be increased from five to nine." O. F. S.

Electric Truck for Handling Coal

The storage battery truck illustrated is used by C. H. Masland & Son, Philadelphia, for hauling coal to boiler house and store yard. Coal is unloaded by gravity from railroad cars into bins fitted with radial gates. The truck is quickly loaded with a ton of coal by opening the bin gate and allowing the coal to drop into the V-shaped truck body.

In the morning the truck hauls coal 300 ft. to the boiler house. After two hours sufficient coal is hauled to keep the boilers going all day, and the truck then carries coal from the bins to the storage pile. With this method about 20 tons can be handled per hr. The



This Electric Truck Quickly Transports Its One-Ton Load

loaded truck makes the trip from bins to storage pile, a distance of 115 ft., in 45 sec., and the return trip (empty), in 35 sec. The load is discharged in 10 sec.

To enable the truck to get on top of the storage pile a runway was built. This is raised once a day so that coal can be unloaded on either side. The truck drives with all four wheels and has no difficulty in negotiating the comparatively steep grade.

By using this method railroad cars are released quickly and demurrage charges avoided. The storage battery truck, moving heavier loads in less time than



The Truck Discharges Its Load in 10 Seconds

is possible with man power, keeps the receiving bins empty, so that coal can be unloaded upon arrival.

Analysis of data on several recent installations furnished by the manufacturer shows the daily operating cost of the truck to be \$3.35. This includes mechanical maintenance charges, interest and depreciation.

The truck is manufactured by the Lakewood Engineering Co., Cleveland.

Grain Limits in Heat-Treated Alloy Steels*

New Etching Process Which Defines the Crystals, Boundaries and Assists in Detecting Faulty Heat Treatment

BY R. S. ARCHER

IN the microscopic examination of aircraft-engine parts made of heat-treated alloy steels, the writer has been forcibly impressed by the failure of the usual etching processes to disclose any but gross defects in heat treatment. It seemed particularly desirable to bring out the grain size of the steel, which is indicated in the ordinary etching processes chiefly by the change in orientation of structure from grain to grain. After various attempts a fairly successful method has been found. The specimens worked with have been mostly chrome-nickel steels heat treated—that is, hardened and tempered—to a Brinell hardness of around 300. A few experiments with other specimens will be referred to later.

Briefly, the method employed consists in etching the steel about 10 min. in a fresh solution of picric acid in ethyl alcohol, and then rubbing off the smudge of carbonaceous matter on moist broadcloth. Different samples of almost identical analysis, heat treatment and physical properties (including resistance to impact) respond quite differently to this treatment. In some, the grain boundaries are developed quite readily, while in others, especially in those whose grain is unusually fine or in which the final hardening heat has not quite obliterated the previous crystallization, the results are more obscure. The exact time of etching to secure the best results also differs for various samples, and the greatest success is usually attained by a process of "tinkering." Such a process is illustrated in a series of photomicrographs, the first six of which are taken at a magnification of 300 diameters. The properties of the steel are as follows:

	Per Cent
Carbon	0.420
Nickel	1.350
Chromium	0.900
Copper	0.025
Manganese	0.740
Phosphorus	0.024
Sulphur	0.036
Brinell hardness	293
Yield point, lb. per sq. in.	131.000
Maximum strength, lb. per sq. in.	144,500
Elongation in 1 in., per cent	28
Reduction of area, per cent	57.30
Izod impact, ft.-lb.	51

The specimen was etched for 2 min. in a fresh solution of 5 gm. of picric acid in 100 c.c. of denatured alcohol. It was then rubbed gently in all directions on moist kersy cloth, the fine polishing wheel being used for this purpose. Its appearance after this treatment is shown in Fig. 1. The specimen was then etched 2 min. more in the same solution and again wiped on cloth. After photographing, this process was repeated up to a total of 15

*From a paper to be presented at the February meeting in New York of the American Institute of Mining Engineers. The author is with the Bureau of Aircraft Production.

min. The results are shown in the photomicrographs Figs. 1 to 5, the total time in the etching solution being given below each micrograph.

By this process the clearest development of grain boundaries was obtained at the end of 11 min., the result after 4 min. more of etching being inferior. The sample was then repolished and etched again for 11 min. continuously in a fresh solution. The result was better than before, and is shown in Fig. 6. Fig. 7 shows this structure at a magnification of 1000 diameters. These photographs do not show the same area as is shown in the first series, since the surface layer has been changed in the repolishing. Fig. 8 shows the appearance of the same specimen as etched for 2 min. in the same solution and dried without any rubbing.

With the same specimen of steel a solution of 5 gm.

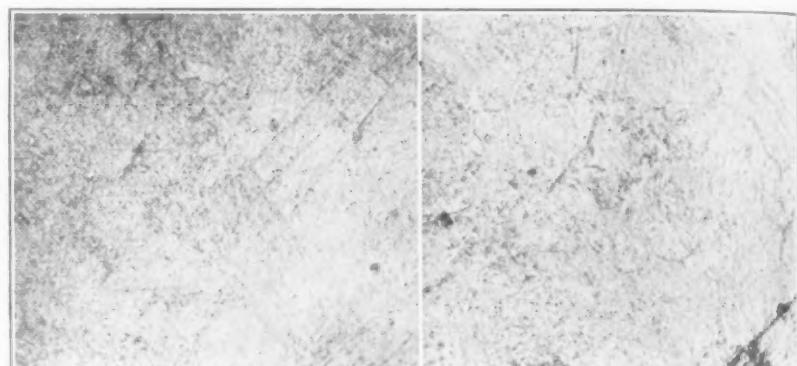


Fig. 1—2 Minutes

Fig. 2—4 Minutes

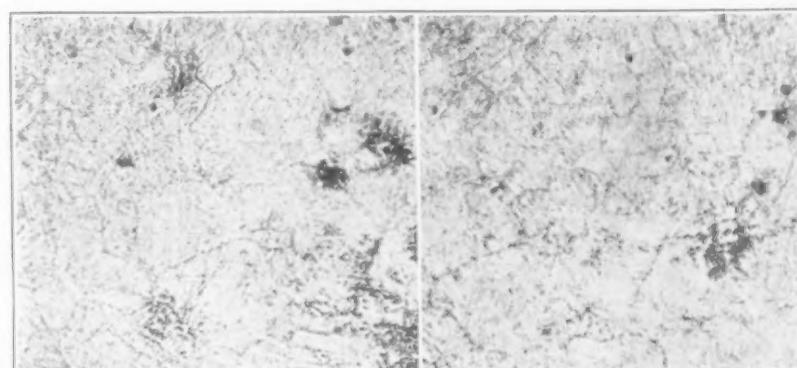


Fig. 3—7 Minutes

Fig. 4—9 Minutes

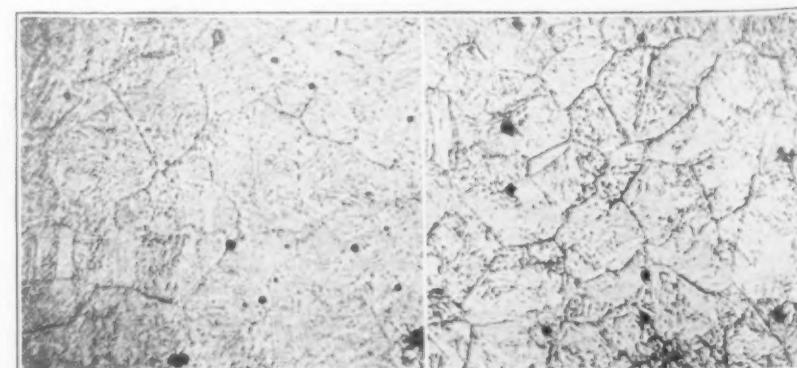


Fig. 5—11 Minutes

Fig. 6—11 Minutes Continuous Etching

of picric acid to 100 c.c. of 95 per cent ethyl alcohol gave results practically identical with those obtained with the solution in denatured alcohol. Absolute alcohol was not tried, nor was any dehydrating agent, such as acetic anhydride. Alcoholic solutions of o-nitro-phenol were found to act too slowly. Mixtures of this reagent with the alcoholic solution of picric acid acted with correspondingly less speed than picric acid, and gave results which were possibly a little more uniform, but not of sufficient improvement to justify the extra time. The same effect might be obtained by diluting the picric-acid solution with alcohol, but this was not tried. The following reagents were tried unsuccessfully: Nitric acid in ethyl alcohol, concentrated nitric acid, bromine in alcohol, and bromine in carbon tetrachloride.

A few experiments have been made with other steels and with chrome-nickel steels of different heat treatment. Attempts to develop the grain boundaries in specimens from chrome-nickel gears, made of S. A. E. about 500, failed to give similar results to those obtained with the same steel in a softer condition. A straight carbon steel, of medium carbon content, was quenched in water from 1600 deg. Fahr. (872 deg. C.) and drawn at 1050 deg. Fahr. (566 deg. C.). The grain boundaries could not be brought out by this method. Attempts with a chrome-vanadium steel were at least

partly successful. The steel in the shape of $\frac{5}{8}$ -in. (15.9-mm.) round bars was quenched in water from 1700 deg. Fahr. (922 deg. C.) and drawn at 1050 deg. Fahr., and had the following properties:

	Per Cent	
Carbon	0.270	Brinell hardness ... 302
Chromium	0.960	Yield point, lb. per sq. in. 146,000
Vanadium	0.210	Maximum strength, lb. per sq. in. 152,100
Manganese	0.570	Izod impact, ft.-lb. 52
Phosphorus	0.023	Elongation in 2 in. per cent 16.9
Sulphur	0.031	Reduction of area, per cent 60.60

Fig. 9 shows this steel etched 20 min. in picric acid and rubbed, while Fig. 10 shows the result of 2 min. etching without any rubbing. It may be remarked that often a development of grain boundaries can be obtained which makes it possible to get a good idea of grain size by visual examination of various fields of the specimen, but which is not good enough for an accurate grain count in any one area. The grain size is usually such as to render the 4-mm. objective convenient for observation and photography. The writer's brief experience with this method has shown that in some brittle steels the grain outlines are developed more easily than in tough steels of similar analysis and tensile properties, other conditions being equal.

The method has been tried for tracing the path of rupture in impact test specimens. It works satisfactorily in the case of very brittle steel, where the fracture is shown to take place around the grain boundaries; Fig. 11 shows such a specimen. In Fig. 12, taken from the same specimen, it can be seen that failure has started, in the grain boundaries, below the actual surface of fracture. The properties of this steel were:

	Per Cent
Carbon	0.490
Nickel	1.900
Chromium	1.020
Manganese	0.740
Sulphur	0.037
Phosphorus	0.037
Brinell hardness	302.0
Izod impact test across grain, ft.-lb.	8.5
Izod impact test parallel to grain, ft.-lb.	2.0

When the resistance to impact is high, the fracture is through the grains. The resulting deformation of the grains causes failure of the etching process to bring out the grain boundaries near the fracture. The manner of failure, however, is readily apparent from the profile of the fracture.

At a recent stockholders' meeting of the Bridge & Beach Mfg. Co., St. Louis, the following directors were re-elected: Hudson E. Bridge, Leo H. Booch, Henry C. Hoener, John F. Shepley, Louis H. Riecke, Laurence D. Bridge and George Leighton Bridge. The board elected the following officers: Hudson E. Bridge, president and treasurer; Leo H. Booch, vice-president and manager; Henry C. Hoener, vice-president; Louis H. Riecke, secretary; A. F. Gammeter, assistant treasurer; George Leighton Bridge, assistant secretary.

The Tolland Mfg. Co., Montreal, has placed on the market a bearing metal known as "Tamco," especially adapted for rolling mill and all other bearings subject to heavy pressure.

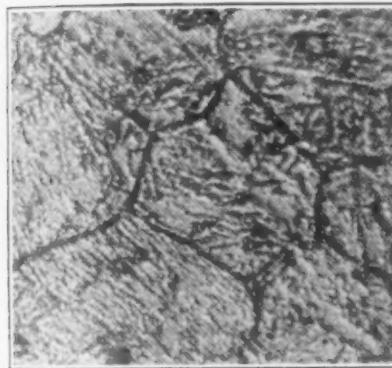


Fig. 7—Same As Fig. 6. $\times 1000$



Fig. 8—Etched 2 Minutes Without Rubbing. $\times 300$

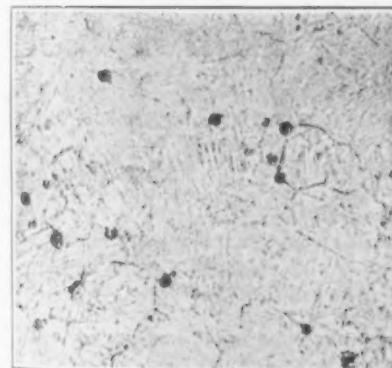


Fig. 9—Chrome Vanadium Steel. $\times 300$

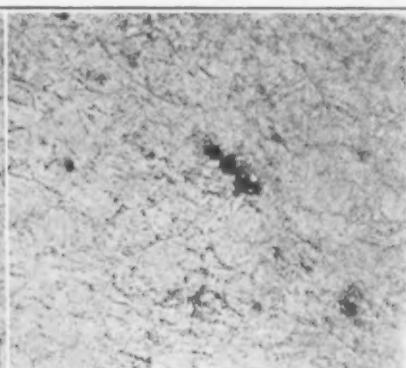


Fig. 10—Chrome Vanadium Etched Without Rubbing. $\times 300$

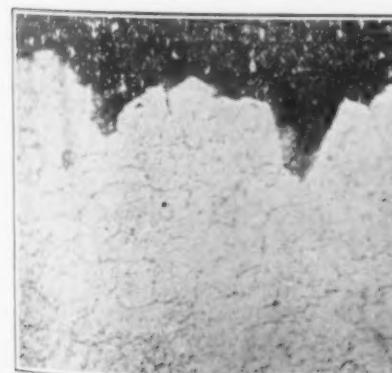


Fig. 11—Path of Rupture in Brittle Steel. $\times 250$

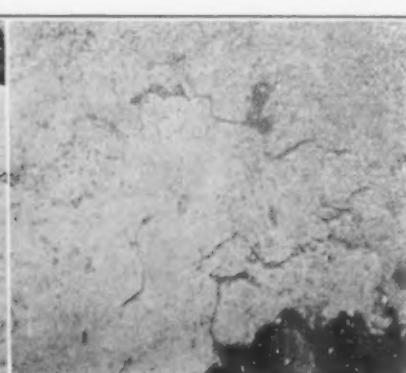


Fig. 12—Incipient Failure in Brittle Steel. $\times 250$

Secretary Redfield Calls His Advisers

Unemployment Problem Will Be Given Consideration and an Effort Made to Stimulate Business—All Is Not Harmony at Washington

WASHINGTON, Feb. 4.—In an effort to mobilize the industries of the country in a campaign against unemployment and for a general acceleration of market conditions Secretary Redfield of the Department of Commerce has called a conference of his "industrial advisers" to meet him here to-morrow. This is the first session that this advisory council has held since it was appointed last month as the result of the demobilization of the War Industries Board. The reason for its call to meet at this time is the increasing unemployment throughout the country and the alarming reports of market stagnation and even more of Bolshevik agitation among the labor unions in a long list of industrial centers.

Secretary Redfield hopes that the conference may be able to map out a program that will encourage a greater buying activity generally in the belief that this will do much to contribute stability to the present uncertain condition. Besides this he hopes that the representatives of the various industries, through the war service committees that are still in existence, will be able to enlist these organizations in a general campaign to meet the present difficulties and to afford the background for later conferences with the Government officials as well as with representatives of labor.

The Advisers Summoned

The men invited to this important conference include: W. B. Dickson, Midvale Steel and Ordnance Co., to represent the steel industry; Samuel P. Bush, Columbus, Ohio, forgings; George N. Peek, former vice-chairman of the War Industries Board, to represent the agricultural implement industry; Pope Yeatman, non-ferrous metals; A. W. Shaw, former chairman of the Conservation Division of the War Industries Board; Edwin B. Parker, former chairman of the Priorities Commission of the War Industries Board; George R. James, former chief of the Cotton and Linters Section of the War Industries Board; Thomas E. Donnelley, former chief of the Pulp and Paper Section of the War Industries Board; James Inglis, cotton baling and transportation; Charles H. McDowell, chemicals; Robert C. Wright, United States Railroad Administration; C. F. C. Stout, hides and leather; William M. Ritter, lumber; Walter Robbins, electricity; John W. Scott, textiles.

The conference is the outgrowth of a meeting which Secretary Redfield held in New York last week with the editors of the more important trade papers of the country. At that time Secretary Redfield pointed out the great importance of securing the co-operation of all industries at this time to meet the growing perils of the situation. Mr. Redfield also inaugurated at that time a campaign to "Buy Necessities Now," declaring that only by such purchases at the present time would it be possible to invigorate market conditions to tide over the difficulties of the winter months. From a labor standpoint, particularly, the present time is the most

dangerous, because outdoor work is difficult except in limited areas, and the spring construction demands will come too late to aid the present increase of unemployment.

Danger of Concerted Movement

It is difficult to forecast just what the conference can do. It is likely that it will attempt to work out a program for greater co-operation and may even try to frame the basis for price reductions in various lines to stimulate present purchases. The difficulty here, however, lies partly in the fact that there is no telling what the Department of Justice might say if there should be a concerted movement, even to cut prices in the interest of a present increase in consumption.

It is likely, also, that an effort will be made to induce the Railroad Administration and the Postmaster General as the custodian of the telephone and telegraph systems to bring those big consumers into the market, instead of waiting for lower prices in the spring. Previous attempts to secure such co-operation had failed.

In many ways the conference comes three months too late. All last fall alert observers warned the Department of Commerce and other Government authorities of the vital necessity of preparing for the difficulties of reconstruction. At that time the Washington authorities declared reconstruction would take care of itself. Even when the armistice was signed the same officials induced President Wilson to tell congress that American industries could best take care of the situation without Government suggestion or co-operation. Three valuable months are gone, the machinery for governmental co-operation has been dismantled, and now the officials here find that without such co-operation there are grave difficulties ahead. At the same time it is too late to do anything in the way of congressional legislation. With less than a month of the present congress left, any suggestion for such action is out of the question. We have not even a good picture of European conditions as a basis for co-operation in stimulating export trade.

Of course, the various war boards are still clothed with war powers, and under the Overman act President Wilson still has plenty of power to meet any contingency. But President Wilson is 3000 miles away, and none of his subordinates now here is willing to take any responsibility for real action.

It is not planned to have any representatives of labor at to-morrow's meeting. It seems likely, however, that later there will be an attempt either through the Department of Labor, or through the War Labor Policies Board to arrange for co-operation of some kind. Chairman Frankfurter, of this board, has been trying for some time to bring about a closer co-operation, not only between the Government and the labor authorities, but also between employers and employees generally. He has met with little success, chiefly because of the exclusively pro-union leanings of all branches of the Department of Labor during the war.

Long List of Unemployed Is Growing

WASHINGTON, Feb. 4.—Unemployment is increasing so rapidly throughout the country that Government officials have abandoned all attempts to make optimistic statements. The seriousness of the labor situation in Great Britain has been reflecting upon American conditions and the failure of the British Government to take drastic steps has apparently encouraged some of the wilder agitators in this country. Labor unrest is reported from many centers and strikes are adding to the difficulties of demobilization in accentuating the grave unemployment situation.

Secretary of Labor Wilson called the copper pro-

ducers as well as the copper miners to Washington. This industry is probably in the worst condition of all. It has piled up 1,000,000,000 lb. of copper at a production cost far in excess of present prices. It is now seeking a market as low as 19c. per lb. against the 26½c. per lb. war rate. But its continuance affects 125,000 workers. To make the situation more serious, 31,000 of these are enemy aliens, and a large share of them are members of unions that have been in the past the centers of violent agitation. There is probably no industry in which the premium upon Bolshevism would be greater than in this one. The only solution

that has offered much comfort is a possibility of the opening of the blockade of the Central Powers which would enable us to export a considerable surplus of copper to Germany and the Northern neutrals.

So far all efforts for governmental assistance have achieved little. There is no possibility of securing further congressional legislation. The War Department has refused to make any changes in its demobilization program and has particularly declined to demobilize by industries instead of by military units.

Can Not Care for Soldiers

The United States Employment Service has tried to meet the situation by canvassing the country for vacancies, but the unemployment has been piling up much more rapidly than it has been able to put men to work. The service has not even been able to keep up with the demobilization of soldiers, let alone try to take care of the large exodus from factories that have cut down their payrolls or have shut down entirely. Besides this the season of the year has been against an easy solution. Outdoor work in all construction lines is almost at a standstill and new work is not being begun on any large scale because of the general expectation that material prices are still coming down.

The figures of the employment service for the current week show an even more rapid increase in unemployment than have been noted in previous reports. The total of men without work officially reported has now reached 265,000 against 210,000 for the preceding week. When these statistics were first made up, Dec. 3, 1918, the surplus reported was only 12,000. These figures, however, are made up from only a limited number of industries in the principal cities. It is doubtful whether they represent more than 20 per cent of the actual unemployment. They are valuable chiefly for the trend they show and that trend has been all one way. Everywhere the unemployed column has been crowding out the labor shortage, which had become so large before the armistice was signed. It can be said with certainty that the list next week will be even greater, nor is there much prospect of real relief for the next six or eight weeks. It is hoped, however, that the end of March will ease up the situation by increasing construction demands and by turning a larger proportion of the unemployed to the farms. The intervening weeks, however, are full of danger, particularly in the larger industrial centers, where the labor unrest has been particularly noticeable.

Conflict Arises

To make the situation worse a conflict has arisen between the employment service and the congress. Nathan A. Smyth, assistant director general of the employment service, charges that a lobby is at work in congress to prevent a new appropriation for this service. He says it is actuated by private employment agencies and by "certain associations" of employers who have evidenced a particular antipathy to labor. There are signs to show, however, that some of the opposition to the employment service, at least, has grown out of the participation of its chief, J. B. Densmore, in the agitation over the Mooney case, in San Francisco.

Mr. Smyth, however, gave out a particularly bitter attack against the "interests" which he accused of fighting his service.

"In the face of an approaching crisis in the employment situation, with unemployment growing daily," said Mr. Smyth, "these private interests would bring to an end about the first of April, if they have their way, all of the work that is being done by the Nation to find employment for its returning soldiers and war workers. They have no alternative to offer and seem to be ready to plunge the country into any kind of disorder and to do the utmost of injustice to those who have fought for the country, in order to foster their own private ends."

"The most frequent charge made against the employment service is that it is using its powers to attempt to unionize the labor of the country. This charge is absolutely false. The service is flatly committed to a policy of strict neutrality. Whenever it has been brought to the attention of the administrative officers

that local agents have shown favoritism either toward organized labor or toward the anti-union elements, prompt investigation has been made and remedial steps have been taken. We have received as many complaints from one side as from the other. This fact in itself indicates that the service has been, with a marked degree of success, able to maintain the policy of strict neutrality."

Annual Meeting of the Mining Engineers

The one hundred and nineteenth meeting of the American Institute of Mining Engineers will be held Feb. 17 to 20 inclusive, at the Engineering Societies Building, 29 West Thirty-ninth Street, New York. Monday's program calls for simultaneous sessions morning and afternoon, devoted to the Institute of Metals, industrial organization, and petroleum and gas. Wednesday morning is taken up with papers on coal and mining, milling and geology. A joint session with the American Institute of Electrical Engineers is scheduled for Wednesday afternoon, the subject being electric welding.

The sessions devoted to iron and steel will be held Tuesday, morning and afternoon, with a simultaneous session in the morning under the auspices of the National Research Council. The program for these sessions is as follows:

IRON AND STEEL

Tuesday, Feb. 18, 10 A. M.

Does Forging Increase Specific Density of Steel? By H. E. Doerr.
Flaky and Woody Structures in Nickel Steel Gun Forgings. By C. Y. Clayton, F. B. Foley and F. B. Laney.
Static, Dynamic and Notch Toughness. By Samuel L. Hoyt.
Development of Grain Boundaries in Heat-treated Alloy Steels. By R. S. Archer.
Water-cooled Equipment for Open-hearth Steel Furnaces. By W. C. Coffin.
Prevention of Columnar Crystallization by Rotation During Solidification. By H. M. Howe and E. C. Groesbeck.
Basic Refractories for Open Hearth. By J. Spotts McDowell and R. M. Howe.

Tuesday, Feb. 18, 2 P. M.

The Shimer Case-hardening Process. By J. W. Richards.
Metallographic Investigation of Transverse-fissure Rails with Special Reference to High-phosphorus Streaks. By G. F. Comstock.
Effect of Rate of Temperature Change on Transformations in an Alloy Steel. By H. Scott.
Davidson Process of Casting Formed Tools. By J. E. Johnson, Jr.

NATIONAL RESEARCH COUNCIL SESSION

Wednesday, Feb. 19, 10 A. M.

Production of Ferromanganese in the Blast Furnace. By P. H. Royster.
A Volute Aging Break. By Henry M. Howe.
Effect of Cold-Working and Rest on Resistance of Steel to Fatigue under Reversed Stress. By H. F. Moore and W. J. Putnam.
Use of Manganese in Open-hearth Practice. By Samuel L. Hoyt.
Report of Steel Ingots Committee, National Research Council. By Henry M. Howe, H. S. Rawdon and F. H. Schoenfuss.

A memorial service to the late Dr. Rossiter W. Raymond will be held Monday at 4.30 p. m. The regular smoker is scheduled for the evening of Monday, and an entertainment for Tuesday evening, presented by George Miller Dyott, a member, who was for three years connected with the Royal Naval Air Service, and who held the rank of flight commander at the time he resigned in 1916. The title of his address will be "Travels in the Mining Districts of Northern Peru and the Upper Amazon," accompanied by motion pictures.

Thursday, Feb. 20, is to be devoted to an all-day excursion to the Federal Ship Building Co.'s plant, Newark, N. J., and the inspection of a ship being electrically welded throughout.

Announcement is made of the formation of the National Steel Co., Conway Building, 111 West Washington Street, Chicago, to serve as direct mill representative and jobber of all classes of light gages of steel. Officers are as follows: president, Edwin G. Fisher; vice-president, Harry G. Masten; secretary and treasurer, A. O'Brien.

Liberty Steel Co. Expanding

Directors of the Liberty Steel Co., with a plant in Trumbull County, Ohio, between Warren and Leavittsburg, have recommended an increase in the capital stock from \$1,500,000 to \$3,000,000. All of the present capitalization of \$1,000,000 common and \$500,000 preferred is outstanding. It is planned to issue \$500,000 preferred immediately and use the proceeds to build four additional sheet mills. The remainder of the new authorization of \$1,000,000 will be retained in the treasury for the present. The board of directors is also to be decreased from seven to five. The new preferred stock will be redeemable at \$110 and it is proposed to amend the present preferred, making it redeemable at \$110 instead of \$105, to make it conform in this respect to the preferred stock of other steel companies in the Mahoning valley.

In his letter to the stockholders, President Edward F. Clark states it is the intention to further diversify products of the company. "The market for high-grade sheets," he says, "is a consistently steady one and is a business, which, when once established, is more stable than the ordinary steel products, which are periodically subject to keener competition.

"The output of the new mills should be very easily sold, for the present consumption of high-grade sheets is greater than the production. We have had very many recent requests for product of this kind which we have been unable to manufacture with our present equipment. The installation of the new mills will be accomplished at a minimum expense. The company's plant was originally planned and constructed for 12 mills, only eight of which were put in. The additional investment will therefore be small in comparison with that of an initial installation. The new mills will begin the rounding out of our finishing mills and will give an annual total output of 60,000 tons. Since the beginning of operations in May of 1918 earnings have been entirely satisfactory. Our order books are filled well into the current year and we are assured of good operations for some months to come."

Tungsten in British China

WASHINGTON, Feb. 4.—The Bureau of Foreign and Domestic Commerce has made public a report by Consul General George E. Anderson, Hongkong, British China, dealing with the wolfram and tungsten situations in that territory.

"Developments in the export trade in wolframite or tungsten ore from the South China field," says Mr. Anderson's report, "have been rather extraordinary of late, but present indications are that things in the course of a short time will come back to normal. The fall in price for the ore in the United States and the absence of that strong demand for it which characterized the trade at the beginning of the export of the ore from Hongkong have resulted in much more of a fall in local prices than has been justified by the extent of the fall in price in the United States. Whereas the local price up to a short time ago was something like \$65 local currency, or about \$55.25 gold per picul of 133 1/3 lb. at exchange then prevailing, it is now from \$38 to \$40 local currency, or at present exchange from \$30.40 to \$32 gold per picul.

"It is expected that things will gradually come around to normal, as buyers continue business upon the basis of a new level for prices. There is every reason to believe that the ore can be mined and put on the American market more cheaply from this field than any other field, and the trade is upon so sound a foundation that there is no occasion for fears for the future, though, of course, things are not likely to be as satisfactory or the trade so profitable as it was during the war demand.

"On the same subject, the bureau has also published an interesting excerpt from the *London Statist*, which pays a particular tribute to the fact that the war efforts of the United States enabled this country to take first rank in the production of wolfram, the chief source of tungsten.

"The keen demand for tungsten led to a remarkable

display of energy in the United States in prospecting for new occurrences of ore and in developing existing deposits in that country. The result is that the United States has outstripped Burma in ore production during the last two years, and has also become a considerable exporter of tungsten metal and ferritungsten alloy to steel-manufacturing countries. Large increases in ore output have also taken place in Japan, in Portugal (where the chief producer is a British company), and in Argentina, Bolivia and Peru. Stimulated by high prices, mining of these ores in the three last-named countries has rapidly extended during the past three years, the output being shipped chiefly to the United States.

"Australia is second in importance among British territories producing tungsten ores. In Queensland many of the principal mines have quite recently been acquired by one of the largest of the concerns which have established tungsten-reduction plants in Great Britain since the war, and the event appears to promise a new era of progress for this branch of mining in Queensland.

New Blast Furnaces at Gutehoffnungshuette, Oberhausen

A long article, with many illustrations, describing the alterations either completed or to be carried out at blast furnace plant No. 1 of the Gutehoffnung Works at Oberhausen, Germany, appears in the issues of *Stahl und Eisen* for April 4 and 11, 1918. The nine blast furnaces in this plant were to be thoroughly modernized and work has been finished on four of them, Nos. 6 to 9 inclusive. This was begun in 1910. The furnaces are each designed to give 400 tons of basic Bessemer iron in 24 hr., or 300 tons of special iron, and for the production of the former they will use chiefly Minette ores. Each furnace has five stoves as against four for all but one of the old furnaces. The hearth has an inside diameter of 13 ft. 9 1/2 in. There are 12 twyers 7 1/16 in. in diameter. The bosh angle is 75 1/2 deg., the bosh diameter 22 ft. 3 3/4 in., and the throat diameter 14 ft. 1 1/4 in. The height from the upper surface of the hearth bricks to the charging floor level is 86 ft. 2 1/2 in., and the capacity of the interior of the blast furnace is about 18,000 cu. ft. At the stock line the brickwork is protected with cast iron rings.

The skip hoist for these furnaces is the Pohlig construction not connected to the furnaces. It travels on rails and bucket charging is used. This is particularly advantageous for the coke which is charged into the conical buckets directly after drawing from the ovens and quenching and so has the very minimum of handling. The ore bins are of reinforced concrete construction, and details of them are given in the original paper, particularly the arrangements for opening and closing the discharge doors. The iron from the furnaces is either taken direct to the steel works in 40-ton ladles, or is run directly to the pig beds. The slag is either handled liquid or is granulated. The gases are cleaned and used in many ways, in the stoves and blowing engines, under boilers, in engines producing electricity, in the steel works and rolling mills, and also for heating two rotating kilns for sintering flue dust. The gas is cleaned down to 0.09 grains per cu. ft. of solid matter for the stoves, boilers and general work; and to about 0.044 grains per cu. ft. for the engines. Special arrangement is made to recover the dirt from the waste water from the washers. The paper then goes on to speak in detail of the blowing engines, power house, pumping stations, etc.

G. B. W.

Toledo, Ohio manufacturers have organized a manufacturers' division of the Toledo Commerce Club's Industrial Department, which will aid in the development of the city as an industrial center and in bringing new plants to that city. The manufacturers' division will be represented by an executive committee composed of Royal P. Scott, Willys-Overland Co., Thomas A. DeVilbiss, DeVilbiss Mfg. Co., J. B. Nordholt, Toledo Steel Castings Co., L. B. Wilson, National Malleable Castings Co., and R. A. Stranahan, Champion Spark Plug Co.

Ocean Freight Rates Rapidly Reduced

United States Shipping Board Meets Further Reductions by British Lines—Restrictions on Importing Machinery and Other Articles into United Kingdom Declared Necessary

WASHINGTON, Feb. 4.—Two great factors dominate the export situation. The first is the embargo which the British Government reimposed upon exports last week when it announced that a long list of manufactures can be imported into the United Kingdom only under import licenses. At the same time came the apparent opening of a rate war on ocean freights, the end of which is not yet in sight. So far the United States Shipping Board has met every cut announced by the British lines.

It is reported here that the British authorities will make use of the import license restrictions to see that British ships get preference in cargoes to the United Kingdom. This, of course, would be an important factor in helping the British lines against our shipping board's tonnage. It can be effective only, however, to the United Kingdom, and therefore may not be such an important factor after all.

The vital feature of the British import restrictions lies in the fact that it comes at a time when American industries are looking to the export market to stabilize domestic conditions. It is likely, however, to increase the pressure upon the conference in Paris to loosen the blockade against the Central Powers and thus open those markets.

The Prohibited List

The British restrictions covered a most important list of industries which have been withdrawn from the open list and must hereafter secure special licenses. The new prohibited list includes:

Machine tools and machinery driven by power and suitable for use in cutting, stamping, or working metal, including lathes, grinding machines, milling machines, boring and turning mills, drilling machines, power presses, planers, punching and shearing machines, shapers, forging machines, screw machines, cutting-off machines, chucking machines, gear-cutting machines, boring machines, centering machines, slotting machines.

Machinery driven by power and suitable for use in cutting, working, or operating on wood, including sawing machines of all descriptions, general joiners, mortise, tenon, boring machines, lathes and rounding machines, box and cask making machines, and all machines accessory thereto, scraping and sandpapering machines, wheelwright machinery, firewood-making and bundling machinery, wood, wool fiber and silk machinery, saw sharpening and setting machines, saw driers, and brazing apparatus.

Machines for grinding, planing, or molding irons.

Manufacturers of aluminum, aluminum powder, baths of same (all kinds), electrotypes, fire extinguishers, guns, carbines, rifles, revolvers, pistols, cartridges, lawn mowers, stoves and ranges, wringers and mangles, weighing machines, scales and balances of all descriptions, vacuum cleaners.

At the same time, the British Government announced the relaxation of export restrictions allowing the free exportation of the following goods to all countries except certain parts of Europe:

Alloys of cadmium and cadmium ore, carborundum, aluminum, crystallized, and all other artificial abrasives and manufacturers thereof; metal cylinders capable of use for storage of gases or liquids under pressure, ferroserium, sheet iron or steel plates for stoves or ranges and parts thereof, silicon steel, tin-plate scraps including scrapped and disused molybdenum wholly or partly made of tin plate, molybdenum molybdenite except molybdenum filament.

The British Explanation

The British authorities explain that the restrictions have been necessitated by the difficulties of the industrial situation in the United Kingdom. They point out the fact that the war reduced the British industries to a skeleton. Their re-exports had been decreased 86 per cent by the war and the exportation of domestic prod-

ucts 46 per cent. In addition to this is the present difficulty of demobilization and the serious strikes and social unrest throughout the British Isles. For that reason they say it is not right to allow their own workmen to walk the streets while importing the product of foreign labor.

Even more vital is the foreign exchange situation in England. With her heavy borrowings from the United States the continuation of unrestricted imports would dangerously lower the exchange value of the pounds sterling—particularly since the United States Government can make no further loans to the British Government.

The British authorities here deny that there is any plan to start a trade war against the United States. At the same time, the War Trade Board of the United States has declared it has no intention of establishing retaliatory measures, pointing out that the British restrictions are no more drastic than those of the other European countries. Only, the latter had not relaxed their wartime restrictions and therefore were not in position that required new action.

As far as the blockade situation against the Central Powers is concerned, no one in Washington is prepared to discuss the future. The officials of the Department of Commerce, as well as the War Trade Board here, seem to favor an immediate relaxation of this blockade in order to take advantage of the empty markets of the Central Powers, as well as the northern neutrals, which also are in the restricted zone.

The authorities here, however, have nothing to do with the matter. It is being handled exclusively in Paris by President Wilson, Secretary Lansing and Vance E. McCormick, chairman of the War Trade Board.

The rate cutting on the various trade routes has continued. In each case, the announcement by the British lines that they have reduced rates has been met by the same reductions on the vessels of the United States Shipping Board.

The New Rates

The new rates for the United States Shipping Board and the various British lines to Australia and South Africa follow:

AUSTRALIA-NEW ZEALAND—Naked steel, \$15 ton; packed steel, \$18 ton; rough measurement cargo, \$25 ton; fine measurement cargo, \$30 ton.

CAPETOWN—Weight cargo, \$20 ton; measurement cargo, \$27 ton.

ALOGA BAY—Weight cargo, \$20.60 ton; measurement cargo, \$27.60 ton.

EAST LONDON—Weight cargo, \$21.20 ton; measurement cargo, \$28.20 ton.

PORT NATAL—Weight cargo, \$21.80 ton; measurement cargo, \$28.80 ton.

DELAGOA BAY—Weight cargo, \$22.40 ton; measurement cargo, \$29.40 ton.

BEIRIA—Weight cargo, \$23 ton; measurement cargo, \$30 ton.

Above rates apply per ton of 2240 lb. or 40 cu. ft. at ship's option and are effective immediately.

The Shipping Board also announced a 50 per cent cut in the cargo rates from North Atlantic United States ports to the Far East. Instead of \$40 per ton close weight cargo—steel and similar items—will be carried at \$20 and all other cargo at \$25 instead of \$45 per ton. The new rates were made effective Feb. 1 and apply to the "usual ports of call," Hong Kong, Shanghai, Kobe, Yokohama, Manila and Singapore.

The Shipping Board has announced a special freight rate on steel shipments from United States North Atlantic ports of \$28 per gross ton to Havre and Bordeaux; \$30 to Antwerp and Rotterdam, and \$40 to Marseilles, Barcelona, Cete, Genoa and Naples. At

the same time it has put into effect the following schedule from North Atlantic ports on all cargo except steel and cotton:

To Rotterdam, Antwerp, Havre and Bordeaux, \$1.25 per 100 lb. or 65c. per cu. ft., ship's option.

To Marseilles, Cete, Genoa and Naples, \$1.60 per 100 lb. or 85c. per cu. ft., ship's option.

To Barcelona, \$1.85 per 100 lb. or 95c. per cu. ft., ship's option.

The export situation in South America has shown little change as far as Washington is concerned. Word has been received, however, by the Department of Commerce from the United States consuls in South America announcing that the British agencies there are accepting cancellations of wartime contracts and are preparing to refill them at the present lower prices.

Analysis of Foreign Trade

The analysis which the Bureau of Foreign and Domestic Commerce has made of the foreign commerce of the United States for the calendar year 1918 reveals a startling slump in the export of manufactures ready for consumption and a decided increase in the export of raw materials, while the import of completed manufactures has increased and the raw material import has shown but a slight decrease. Out of total exports of \$6,048,314,356 in 1918—against \$6,169,617,225 in 1917—the exportation of completed manufactures was only \$2,069,414,254 against \$2,704,393,989 in 1917. The exportation of manufactures for further use in manufacturing were \$1,053,479,322 in 1918 against \$1,316,693,291 in 1917, which the export of raw materials increased to \$953,044,947 against \$780,713,597 in 1917. On the import side of the trade balance, the figures for the total importations increased from \$2,952,467,955 to \$3,031,304,721 in 1918. Of this the completed manufactures increased from \$387,916,685 in 1917 to \$404,904,467 in 1918; manufactures for further use in manufacturing from \$541,482,701 to \$648,955,417, and raw materials decreased from \$1,268,185,283 in 1917 to \$1,221,122,661 in 1918.

The War Trade Board has announced that licenses for the importation of wolfram will hereafter be issued freely provided the applications therefor are otherwise in order.

Simplified License Policy

The War Trade Board has also announced a general relaxation of export license procedure. The board has issued the following statement of its simplified policy:

The American exporter will be given broadened scope for the conduct of his business by the simplification of procedure and the relaxation of restrictions announced to-day by the War Trade Board. This simplification in most cases takes the form of easing the exporter's task of procuring export licenses.

The procedure by which the exporter was forced to procure export licenses during the war was vitally necessary while actual hostilities were in progress, but at the same time in many instances it was admittedly cumbersome. The present policy and tendency of the War Trade Board, it was stated, is to relieve the exporter of any cumbersome procedure in the process of licensing as soon as it becomes possible.

From the very beginning, the War Trade Board has used two distinct systems of export licensing; the first requires an individual export license to authorize an individual shipment; the second involves the issuance of a general license, which permits the export of specified commodities to specified destinations without the necessity of securing any license from the War Trade Board.

The present tendency in the relaxation of export restrictions is to transfer as many kinds of export shipments as is possible from the first class to the second. In other words, present policies aim to do away with individual licensing whenever possible and to substitute for this the system of licensing governed by the commodity in question or the country of destination.

As a result, the number of shipments which fall under this simplified procedure is constantly expanding and the shipper is given greater convenience because in such cases he does not have to apply to the War Trade Board for an individual license but must conform merely to the shipper's export declaration, such as is required by customs procedure

at all times. Moreover, it was stated that the present policy of licensing relaxation permits not only unrestricted shipment of commodities no longer on the conservation list, but also allows the shipment to the Allied countries or the colonies of commodities still on the conservation list where the value of no one commodity exceeds \$200.

This policy is specifically applied to export shipments to the United Kingdom, France, Italy, or Japan and their colonies, possessions and protectorates. Belgium and the Belgian Congo are also included. And the same relaxation of restrictions for exportation is applicable to Canada and Newfoundland.

In the case of export shipments by mail, attention was called to the fact that export licenses were not to be regarded as permission to trade with the enemy. Shipments by mail may not be consigned to persons on the enemy trading list or persons believed by the sender or the War Trade Board to be acting for or on behalf of such enemies. Furthermore, although hereafter export licenses will be freely granted permitting the exportation by mail, to all countries, of written matter and printed matter, such shipments must in no case be employed as a means of communication with enemy interests.

First All-Day Session of Cleveland's Mechanical Engineers

The Cleveland Engineering Society Section of the American Society of Mechanical Engineers and their guests had their first quarterly all-day convention at Cleveland on Feb. 4 at the Chamber of Commerce building. The program specifies the following papers and other features:

"Rubber and Its Manufacture," by Prof. H. E. Simmons, Akron, Ohio; "Electric Traveling Crane Development," by G. W. Shem, Alliance Machine Co.; "Some Experiences of Engineers in France," by Col. J. R. McQuigg; "How the Big Guns were Developed," by Lt.-Col. G. M. Barnes, Ordnance Department.

Following a luncheon at noon was an excursion to the National Acme Mfg. Co.'s new plant—7 acres under one roof. In the evening Dr. Charles S. Howe, Case School of Applied Science, Cleveland, was toastmaster at a dinner at the University Club and an address was delivered by Charles A. Otis, War Industries Board.

Crane Builders' Meeting

The disposition of locomotive cranes ordered by the Government was the subject of a second meeting of the locomotive crane manufacturers held in Cleveland, Jan. 30. A suggestion came from Washington that crane manufacturers make a report to the Government recommending such changes in cranes already built but not yet placed in use and those now in the process of construction that will make these cranes suitable for use by the railroads or some Government department for work different from that for which they were originally designed. The subject will be further discussed in Washington this week at a conference between a committee of the crane builders consisting of Sheldon Carey, Browning Co., Cleveland, chairman of the crane builders' organization, and representatives of the Brown Hoisting & Machinery Co., Cleveland, and of the Industrial Works, Bay City, Mich., with Lieut.-Col. A. LaMar of the office of the Director of Sales of the War Department.

Studebaker's Expected Expansion

Because of the construction of the new Studebaker Corporation plant, the number of employees will be increased from the present 4500 to 16,000 in 1920, thereby raising the payroll from \$4,824,000 to about \$17,500,000. This was stated by President A. R. Erskine at a complimentary dinner given by the citizens of South Bend, Ind., recently. He said that the new plant will be fully completed by July 1, 1920, and will have an outside capacity of 500 cars daily. Then the cost of supplies and materials will amount to approximately \$75,000,000 yearly, as compared to \$16,000,000 spent in 1918. Five years ago the average number of employees was 2620; in 1918, 3683.

Some German War Products

Glimpses into German manufactures during the war are given by the War Trade Intelligence Department of the British government and are recorded in a pamphlet recently issued. Information is given concerning the company of an Andreas Jopp of Mehlis-in-Thur, engaged in making parts of various bicycles of English and French models. The chief parts made were crank axles, spindles, gear wheels, cranks, etc. These were packed in cases and marked "Amsterdam," the informant being told by the German manager that they were intended for the English market. The output was roughly 2000 cases monthly, each case containing from two to three thousand parts.

It was learned that the factory Alexanderwerk, A. von der Nahmer, A. G., Remscheid, was engaged in making household machinery, such as coffee grinders, sausage, bread and potato machines, lawn mowers, etc. First the machines were tin-coated, but later with zinc, and then were of enamelled iron. Material was sent to Austria, Turkey, Holland, and some was labelled "London." All the household machinery enumerated was sent to Holland.

One factory Nahmaschinenfabrik G. Pfaff, Kaiserauken, though chiefly engaged on machine guns and fuses, also manufactured sewing machines for post-bellum overseas trade.

The Motor Truck as a Freight Carrier

Investigation of the tonnage hauled by motor truck, shows its capacity to be remarkable. It is reported, for example, that a 6-ton Packard, entered in the National Truck Efficiency Test last summer by the Pennsylvania Utilities Co., Easton, Pa., hauled enough freight in three months to make up six trains of 50 freight cars each.

The truck was in operation 92 successive days and nights and in exact figures transported 11,828 tons of material—coal, ashes, sand and brick, on an average 128 tons per day. Operated on this basis for a year this would amount to 45,000 net tons of material. The distance covered was 7851 miles, equivalent to nearly three trips from New York to San Francisco every month, loaded to capacity. During the three months it was out of service for repairs only 32 hr. and most of that time, the owners state, because of an accident which was the fault of neither truck nor driver.

Remodeling Blake & Knowles Pump Works

That the end of the war has brought no curtailment of the expansion of the plans of some of the larger business interests, is indicated by the action of such companies as the Worthington Pump & Machinery Corporation, which, soon after the signing of the armistice, and presumably upon the completion of Government contracts, entered into a new contract with the Aberthaw Construction Co., Boston, for the completion of the remodeling of the East Cambridge plant of its Blake & Knowles Works. This plant employs 2300 men.

The extension and improvements will total approximately \$1,750,000 when completed. In all, eight new buildings have been erected and four remodeled, in addition to the construction of new craneways and miscellaneous additions.

The plans are to complete the work before spring.

Iron Mines Wage Reduction

The Penn Iron Mining Co., a subsidiary of the Midvale Steel & Ordnance Co., has decided to suspend operations at its No. 3 East Vulcan shaft, and after a limited number of the men employed there have been provided for elsewhere, about 40 will be discharged. At the West Vulcan and other mines of the company a slight reduction in the working forces will be made. Besides these reductions in forces, it is stated that a reduction in wages was scheduled at all the company's mines to date from Feb. 1, averaging about 10 per cent, or practically a return to the scale of October last.

ORGANIZE FOR CHICAGO BASE

Western Consumers of Steel Assert Pittsburgh as Sole Basing Point Is Not Equitable

That the endeavor of a number of Western consumers of steel to have Chicago re-established as a price-basing point on the same basis as Pittsburgh is progressing is evidenced by recent developments. Reference to the start of the movement was made in the Chicago iron and steel market report in THE IRON AGE of Jan. 16. Since then the consumers who are interested have organized the Western Association of Roller Steel Consumers. James E. MacMurray, of the Acme Steel Goods Co., Chicago, is president; George M. Gillett, of the Minneapolis Steel & Machinery Co., vice-president; Paul Willis, treasurer, and W. E. McCullom, of the Steel Tank Manufacturers' Association, Chicago, is temporary secretary. Permanent offices will be established in a few days. The membership includes consumers throughout the middle section of the country. Most of the structural steel fabricators of Kansas City, Milwaukee and other cities have allied themselves with the movement, and those in and near Chicago are coming in fast.

The directors of the new organization held a meeting Feb. 1, at the Union League Club, Chicago, and subsequently it was announced that a vigorous campaign will be waged, emphasis being laid on the large tonnage of steel produced at the lower end of Lake Michigan, the low cost of producing steel as compared with that in the Pittsburgh territory, and the disadvantage Western manufacturers labor under in selling their products in the East in view of the freight rates being in favor of Pittsburgh. Some of these manufacturers do a world-wide business, and it is pointed out that when a Western manufacturer ships East he must pay the Pittsburgh price for his steel, plus the freight to Chicago, plus the freight on his finished product from its place of manufacture to the Eastern destination. It is argued that were Chicago made a basing point, and the freight of \$5.40 per ton eliminated from the Chicago price, both manufacturers and ultimate consumers in the West would be benefited, while there would be created an incentive for the establishment of new consuming plants in the West. Under the sole Pittsburgh basing it is asserted that all the advantage lies with Eastern consumers.

Among those who attended the meeting at the Union League Club were George Lasker, of the Lasker Iron Works, Chicago; Frederic de Coningh, of the Sykes Co., Chicago; C. A. Finkel, of A. Finkel Sons & Co., Chicago; T. E. O'Brien, of the Leader Iron Works, Decatur, Ill.; M. F. Moore, of the Kewanee Boiler Works, Kewanee, Ill., and W. A. Wagner, of the Wisconsin Bridge Co., Milwaukee, Wis.

Determining Oxygen in Steel

Technological paper No. 118 of the Bureau of Standards, "A Critical Study of the Lebedur Method for Determining Oxygen in Iron and Steel," by J. R. Cain and E. Pettijohn, discusses errors in the method, and their remedies. It also describes special methods for preparing samples as well as new forms of apparatus. The conclusions of the bureau's experts are:

The Lebedur method requires extraordinary precautions to obtain reliable results. The errors we have described undoubtedly affect in greater or less degree nearly all results by this method that have been described in the literature, and if these are approximately correct it is because of compensation errors.

The method determines with certainty only oxide of iron, oxides of manganese above MnO_2 , and the oxides of nickel, copper and tungsten, if the latter three ever exist in steel. In turn, such oxides are determined correctly only in case they exist in the metal uncombined as silicates which probably seldom happens.

Lebedur oxygen determinations show no distinguishing features for acid Bessemer, basic or open-hearth, duplex, electric or crucible steel, and no differences in steels deoxidized with a variety of deoxidizers.

ESTABLISHED 1855

THE IRON AGE

EDITORS:

A. I. FINDLEY

WILLIAM W. MACON

GEORGE SMART

CHARLES S. BAUR, *Advertising Manager*

Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *President and Treasurer*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Bldg. Pittsburgh: Park Bldg. Boston: Equitable Bldg. Philadelphia: Real Estate

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

Fritz J. Frank, *Vice-President*

George H. Griffiths, *Secretary*

Trust Bldg. Cleveland: Guardian Bldg. Cincinnati: Mercantile Library Bldg. San Francisco: 320 Market Street. Subscription Price: United States and Possessions, Mexico, Cuba, Shanghai, \$5.00; Canada, \$7.50; Foreign, \$10.00 per year. Single copy, 20 cents.

Prospective Price Levels

Whatever theories may have been entertained individually as to the course of prices after the ending of the war, the conduct of practically all buyers of commodities and labor is now the same. The policy is a waiting one. Only the materials that are required for immediate use are being bought, simply the materials to do without which would be very inconvenient. With the employment of labor, much the same policy is followed, except that many employers who have regularly organized forces are making a special effort to keep them employed, not for purposes of profit, but for the benefit of the employee.

When buyers pursue "the waiting game" in the matter of prices, they get what they wait for. The policy now is so general that results cannot but follow. Of course, there are many sellers of commodities who are claiming to believe that prices of their products will not decline materially, but it is often noticed that these same interests refrain from making plant improvements or repairs that are recognized as essential, because they feel that present prices are too high. As a seller the individual may preach that prices are not going to decline, but as a buyer he practices another doctrine.

No great class of people can be picked out to whom it would be advantageous for the present low purchasing power of the dollar to be continued. The wage earner, for instance, may well entertain hopes that in a general decline in values the cost of living may come down more than his wage rates. The capitalist who wishes to invest money in ventures that may yield him a profitable return shrinks from locking up capital when money does not go far in construction enterprises, fearing that costs of construction would come down after he had made his investment, and prefers that the readjustment come at once, so that he can proceed with his contemplated undertakings. Bondholders, of whatever sort, see no advantage in the present situation, for their interest payments are not worth as much as formerly, and if the capital is paid in present circumstances it cannot be reinvested to obtain an intrinsic value equal to that obtainable when the bond was originally purchased.

The whole trend of market prices, therefore, is downward. A readjustment is being forced by the attitude that men have assumed toward the mak-

ing of purchases. When a waiting situation like this has been developed, it continues until enough men change their minds to establish a counter force equal to the original force. Never, however, does the thing stop there. A swing in the opposite direction always results. Confidence begets confidence. No one can predict either the extent to which market prices will fall or the length of time that will be consumed in the process, but all precedents indicate that when the decline does stop it will be followed by an advancing tendency. There is not going to be a period of years of uninterrupted declines. There may be alternations of movement, and the dips may be to successively lower levels, but there will be reaction as well as action. The present temper of men is such, however, that the action must proceed much farther than it has to date before there can be any reaction.

Correcting a Mental State

It would be well to recognize clearly that the United States is suffering from a mental condition. The physical condition is not one of great divergence from the ordinary equipment of peace times. There are a few shell factories that are not needed in normal times and perhaps a trifle more shipbuilding capacity than is absolutely essential, but that is not much. The financial condition is fine. Early last October there were observers who held that a moratorium might be advisable, should peace come suddenly, but nothing of the sort proved in the least degree desirable. People are able to pay their debts, or owe on the finest collateral. Most business interests have unusually large reserves. The economic situation is not what would be desired, but it presents no need for adjustment that could not be met, and nothing unsound that could not be made sound, if men as individuals were ready to return to the normal order of things and make their respective contributions to that end.

The difficulty is mental. The war deranged material things in the United States very little. It greatly improved financial conditions. It greatly altered the relations between the market value of real and personal property and the market value of the commodities that are bought and sold as well as the market value of labor, but after such a derangement a return to normal alignments would follow from the play of natural forces, if the mental state were not in arms against the readjustment.

The strong mental attitude obtains not with a few men or a few groups of men, but with the majority. The feeling of the individual is that the war has mentally given him something which he is going to strive to maintain. The employer takes the stand that if the selling price of his product is to be reduced, the labor cost must come down first. The employee takes an even more radical position, that even if the selling price of the commodity is reduced, he will not accept lower wages, that a decline in the market value of the commodity he produces is somebody's else business and he has no concern with it. There has even been a disposition in some quarters for employer and employee to reach an understanding whereby production is to be curtailed in order to keep the public paying high prices, the workmen using their funds accumulated for striking purposes to maintain the joint strike against the public.

A bill is pending in Congress to prevent immigration. Some of its sponsors talk of protecting the American labor market. Others are more frank and speak of the bill as intended to keep bearers of Bolshevik preachings out of the country. The object is commendable, but one should not assume that the mental state in the country is normal and merely needs to be protected from infection.

Since early in this country's participation in the war it was recognized that after the war there would have to be a period of readjustment so that normal activities could be resumed. No one has definitely denied that readjustment and rearrangement are necessary, yet the minds of many men are set against the readjustment. They are willing that others should readjust but are quite unwilling to make a contribution themselves.

The first step toward the solution of a problem is to recognize the problem and state it in definite terms. The present problem is one of the mental condition, not of the physical or financial condition. Men must be mentally prepared to accept readjustment or it cannot be effected. For the workman, the first requisite is that he think of his function as that of returning a day's work for a day's pay, whatever that pay may be. The incident of the war has not made it that more goods can be produced with less labor than formerly, nor has it made it that a plant investment is more efficacious than formerly. Such notions represent wrong mental conditions, which must be eliminated.

Housing Corporation and the Unions

The housing projects undertaken in many cities by the Government have met with serious checks at several stages of their progress. Even now in one city the building code has interfered with the work. In another city the strike of carpenters in New York has forced the Government to supplant the local contractors and assume the burden of bringing the task of building to completion. That is not easy to do. The union continues militant.

The houses were planned to give a maximum of results from a minimum of expenditure in erection and finishing. Time was a big factor and every corner was cut in arriving at the desired ends. Our various codes for city building departments are not invariably and universally so framed. Strug-

gles between unions to secure some particular branch of the building business has usually been arbitrated by the combatants without the participation of the public. For example, it might be agreed as was the purpose in one city of the Central West that the connection with the street line of pipe should be done by a \$10 plumber and not as it used to be done by a \$2 sewer digger. Other similar practices were urged in the interest of "hygiene," and the outcome was to increase the cost of a cottage some 20 per cent.

Simplifying the building of houses for working men in Bridgeport, Waterbury and other Eastern cities has been approached radically by the United States Housing Corporation, and a technical report is now in preparation which will undoubtedly prove that some of the labor restrictions, as in the case of the Central Western city just mentioned, are far from necessary, that they do not add to the sanitation, the permanence, or the efficiency of the home. But is it probable that the unions involved are anxious to see these model houses finished and in use as specimens of what can be accomplished with successful and very saving economies? Rather is it to be expected that delays and disaster would be the portion meted out by those whose economic beliefs do not favor examples of this class of construction. What has happened is what might have been anticipated. Further handicaps are not improbable.

Employers and Influenza Hospitals

A movement is under way in Massachusetts, under the leadership of a group of influential Boston men, to secure the co-operation of manufacturers in the establishment of a model cubicle hospital, so called, for the treatment of influenza and pneumonia and for the further scientific study of the diseases. The plan originated with Dr. William A. Brooks of Boston, who during the war was surgeon general of Massachusetts and medical adviser of the recruiting service of the Shipping Board. In his official capacities he fought influenza in an open air hospital created on the grounds of his large private hospital in a suburb of Boston, and, with his staff, treated hundreds of cases with much success. From this experience the cubicle hospital system was evolved.

Briefly described, such a unit consists of a cheap one-story wooden structure, having a single long corridor from which opens on one side a series of ells, each a room for two patients, the ells being spaced beyond the nine foot range of infection from influenza. The walls of the rooms are hinged at the top, and in good weather are swung upward and hooked to the ceiling. Patients are given a maximum of fresh air and sunlight. Astonishing results were obtained by this treatment where drugs failed to make headway. Medical men generally agree that fresh air is the one sovereign remedy that has been brought forward. The cubicle building plan is held to give completely satisfactory results, at a minimum cost. A 20-patient unit can be constructed, under normal conditions, for not much over \$2,000.

The plan for a research and educational hospital along these lines is appealing to large employers of

labor, not only for promised results in the broader sense, but in the possibility of the private application of the idea in connection with medical departments of the large industrial establishments. A great many physicians believe that the influenza menace is by no means ended. Sporadic outbreaks of the disease have followed the suppression of the epidemic. A not uncommon theory is that two or three years will elapse before influenza in its recent serious form will have disappeared. Employers realize its economic results, for they have had experience. The country lost 150,000 persons, of which a very considerable proportion were workers. Managers remember how they threw every resource into the effort to stem the spread of the disease and how they were handicapped.

Therefore it is not surprising that Dr. Brooks' plan promises to meet with ready response in the way of financial assistance. Already a volunteer corps of thoroughly trained scientific investigators has been secured. If the fresh air treatment is so really efficacious as is now supposed, every one wants to know about it, especially employers who realize better than any one else what it will mean to have a sharply reduced mortality rate and accelerated recovery among their workers. The prophecy is heard that further successful demonstration of the Brooks plan will lead to the establishment of cubicle hospitals as an accessory of the medical departments of manufacturing plants.

Post-Bellum Patriotism

No feature of the recent banquet of the Pennsylvania Society in New York was so significant or encouraging as the appearance of the new governor of Pennsylvania, the Hon. William C. Sproul, a manufacturer of iron and steel, a builder of ships, a man of large affairs of a type too seldom seen in legislative halls or in executive positions in State or Nation. The Governor, in a straightforward, earnest speech summoned the people of his great commonwealth to perform the duties and meet the problems which now confront them. He said the exaltation of patriotism makes all tasks easy, and the severe test comes after war ends, when extravagance and inefficiency must be abandoned and things must be gotten down to a workaday basis. He expressed his conviction that the people would do this, in spite of any unwise legislation that might delay but could not stop their progress.

Will there be any dollar a year patriots now? It is announced at Washington, in phrases that are really funny, that a movement is under way to get the ablest business men to contribute a year wholly to the service of the Government, and this effort may take practical form, but whether it does or not, there is everywhere an urgent demand for unselfish, enlightened and untiring service from every man who served his country in any way during the war. Men like Governor Sproul are entitled to loyal and enthusiastic support in all worthy efforts, and more men of that type must be elevated to high official positions. Certainly it does seem that our various war boards could have been made to function for the period of readjustment, but plans to operate in the large war time way were apparently

not considered feasible and many of the personnel felt they were sorely needed at their accustomed places in finance, business and industry. It is to be hoped that those remaining will not allow themselves to be demobilized from public service when there is urgent demand for their help.

The spirit of international co-operation which is in the air and which must voice itself in the peace settlement at Paris was discussed in an address before the Merchants' Association of New York by Secretary of the Interior Lane. He referred to the world postal union as a conspicuous example of a workable international institution. In the year before the war there were 135 international conferences and there was an unmistakable co-operative trend in business, in labor movements and among scientific bodies. International interdependence, which was offered in these columns a few weeks ago as a keynote for the readjustment in trade among the nations, is merely synonymous for international co-operation, and the ways must be made easy by Congress and by business interests for international agreements that are, to be sure, not one sided and thus render remote any misunderstanding calculated to lead to friction. Co-operation that makes for profit for the United States must provide for trade movements into as well as away from the country as pointed out in the clear added contribution to the subject made in the interview in THE IRON AGE of January 23 with Mr. Munoz of the Federal Export Corporation.

The proposal has been made that builders of machinery guarantee the purchasers of their products, up to a certain agreed percentage against any fall in prices. This to be, of course, limited to a specified time. If the plan has any merit, it might well be extended to the building trades? Many building projects are hanging doubtfully in the air. While compulsory construction may be expected here and there through Federal and State and other governmental activity, it would seem safer from a broad economic standpoint to get some concerted and stimulating action among the manufacturers who businesses are closest related to building. Besides the stabilizing influence of a revival in this direction, it would afford favorable opportunities for using that supply of labor that with the slowing up of munition manufacturers and the demobilization of our soldiers promises to become serious.

In the matter of the embargo against the importation into Great Britain of manufactured articles, it is to be remembered that ever since the armistice she has had an almost overwhelming fear of so-called Bolshevism. Regarding this is likely to be nurtured if there be any considerable unemployment, measures have been taken to get the wheels of peace industries turning, partly through placing of Government orders. The checks to exports because of the higher than war time prices have not helped. Meanwhile our market should be most anywhere else than England with exchange as it is.

Diagram of Steel Manufacture

The diagram of steel manufacture which is being sent by THE IRON AGE to subscribers and others interested, is proving very popular among many people in varied lines of manufacturing and also in educational pursuits. Among those who have written for the diagram are the following:

An alloy steel corporation.....	Canton, Ohio
A machine company.....	Elyria, Ohio
A steel company.....	Dallas, Texas
A railroad company.....	Omaha, Neb.
A manufacturer of drop forgings and tools.....	Brooklyn
Brokers in ores, ferroalloys, metals and pig iron.....	Philadelphia
A steel company.....	Chicago
A manufacturer of gear cutting machines.....	Newark, N. J.
A steel company.....	Milwaukee, Wis.
A manufacturer of malleable castings.....	Cleveland
A manufacturer of iron and steel forgings.....	Camden, N. J.
Importers, exporters and ship agents.....	New York
An engineering company.....	Wilmington, Del.
A manufacturer of electric traveling cranes.....	New York
United States Tariff Commission.....	Washington
An electric and manufacturing company.....	East Pittsburgh, Pa.
Engineers.....	Chicago
Ordnance Corporation.....	Jersey City, N. J.
War Department—Aircraft Production Bureau.....	Washington
A manufacturing company.....	Boston, Mass.
An electric company.....	Schenectady, N. Y.
A manufacturer of hams.....	Buffalo
Ordnance Department.....	Boston
A steel company.....	New York
Brokers for equipment, machinery, tools, iron, steel and metals.....	New York
A manufacturer of steel shapes, plates and bars.....	Philadelphia
A steel company.....	Bethlehem, Pa.
A manufacturer of bolts, nuts and rivets.....	Pittsburgh
A manufacturer of shovels and railroad track tools.....	Pittsburgh
A steel company.....	Beaumont, Texas
A steel and wire company.....	Peoria, Ill.
A manufacturer of high speed steel and tools.....	New York

The diagram, prepared originally for the Carnegie Steel Co. by R. B. Woodworth, engineer, shows graphically the various stages in the manufacture of steel. To meet a part of the expense of printing and mailing, the diagram is sent at 3c. per copy.

Standard Parts Co. Organization

In placing its operations on a peace-time basis, the Standard Parts Co., Cleveland, has reinstated the plan of separate general management for its various plants. This method replaces the centralizing of all activities in the general offices which was made necessary in order to conserve man power during the war and especially during the time when a great part of all production was for one customer, the Government. The executive and supervisory offices, credits, collectors, disbursements and contracting for the larger material supplies will remain in the general offices.

The several plants will be under general managers as follows: Standard Welding plant, H. H. Newsom; Perfection Spring plant, F. F. Grimmelsman; Bock Bearing plant, George H. Kleinert; American Axle and Cincinnati Axle plants, D. K. Moore, with headquarters in Cleveland; Canton Spring and Canton Forge plants, J. B. Childe; Connersville Spring and Axle and Wheeling Axle plants, E. V. Overman, with headquarters in Cincinnati; Pontiac Spring plant, B. A. Litchfield; Flint Spring plant, R. T. Armstrong; St. Louis Spring plant, H. B. Champ; Perfection Heater plant and Spring Jobbing division, B. R. Winborn.

Handling Machinery Manufacturers Elect

The board of governors of the Material Handling Machinery Manufacturers' Association last week elected the following officers: President, Calvin Tompkins, former dock commissioner of New York; vice-president, James A. Shepard, Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.; treasurer, Lucien C. Brown, Elwell-Parker Electric Co., Cleveland; acting secretary, Fred Stadelman, Wellman-Seaver-Morgan Co., New York. A paid secretary will later be employed, until which time Mr. Stadelman will serve.

CONTENTS

Effect of Heat Treatment on Bronze.....	347
Carbon Steel Co. Additions.....	349
Utilization of Waste Heat.....	350
Secretary of Labor Warns of Industrial Unrest.....	350
Pulverized Coal for Metallurgical Furnaces.....	351
The Steel Converter Process for Foundries.....	352
Women a Fixture in Electrical Industry.....	353
Potash Content of Blast Furnace Charges.....	355
America and the Industrial Reconstitution of France.....	356
New Method of Screw-Thread Inspection.....	357
War Department Warns Against Fraud.....	359
Interstate Iron & Steel: Chipping Alloy Steel Billets—	
The 35-in. Blooming Mill (Illustrations).....	360-361
Reducing the Cost of Disability.....	362
Canadian Manufacturers and Belgian Reconstruction.....	363
No Special Rates on Goods Shipped in Steel Containers.....	363
Would Permit Business Men to Co-operate.....	364
Electric Truck for Handling Coal.....	365
Grain Limits in Heat-Treated Alloy Steels.....	366
Secretary Redfield Calls Conference on Unemployment.....	368
Program of Annual Meeting of the Mining Engineers.....	369
Liberty Steel Co. Expanding.....	370
Tungsten in British China.....	370
New German Blast Furnaces.....	370
Ocean Freight Rates Rapidly Reduced.....	371
Western Steel Users Organize for Chicago Base.....	373
Editorials:	
Prospective Price Levels—Correcting a Mental State—	
Housing Corporation and the Unions—Employers and	
Influenza Hospitals—Post-Bellum Patriotism.....	374-376
Engineering Council Opens Washington Office.....	377
Pig-Iron Production for January, 1919.....	378
Iron and Steel Markets.....	380
National Metallurgist Society of America Organized.....	392
Matthew Addy Company Sixty Years Old.....	393
Iron Famine in Norway.....	393
Algoma Steel Corporation Operations.....	393
Metal Markets.....	394
Prices Finished Iron and Steel, f.o.b. Pittsburgh.....	395
Personal.....	396
Southern Supply and Machinery Dealers' Convention.....	398
Meeting of the United States Chamber of Commerce.....	398
Obituary.....	399
Book Reviews.....	400
Stages in Steel Refinement.....	401
Tungsten Ores in the United States in 1918.....	402
Production of Dominion Steel Corporation.....	402
Unemployment at Detroit.....	403
Correspondence—Russian Sheet Iron.....	403
Government Blast Furnace and Steel Plant Proposed.....	404
Detroit Munition Manufacturers Organize.....	404
Merchant Shipbuilding at Hamburg.....	404
United States Chain & Forging Co. Organized.....	404
Exports of Tin Plate.....	404
Labor Troubles.....	405
Situation as Regards Government Contractors.....	406
Public Building Projects.....	406
Nova Scotia Steel & Coal Plant Closed.....	406
Machinery Markets and News of the Works.....	407

Engineering Council Opens Washington Office

The personnel of the recently organized National Service Committee of the Engineering Council of the United Engineering Societies is as follows: M. O. Leighton, Washington, member American Society of Civil Engineers, chairman; C. B. Burdick, Chicago, and George F. Swain, Boston, members American Society of Civil Engineers; Philip N. Moore, St. Louis, and L. D. Ricketts, Warren, Ariz., members American Institute of Mining Engineers; Andrew M. Hunt, San Francisco and New York, and Andrew M. Lockett, New Orleans, members American Society of Mechanical Engineers; W. C. L. Englin, Philadelphia, and Bancroft Gherardi, New York, members American Institute of Electrical Engineers.

A Washington office has been opened at 502 McLachlen Building, Tenth and G streets, Washington.

The American Society for Testing Materials has accepted an invitation to become a member of the council.

BLOW OUT MANY FURNACES

A Net Loss of 27 Stacks in January

January Output 3,302,260 Gross Tons, or 4237 Tons Less Daily—Ferroalloys Total 32,787 Tons, Only 10,404 Tons Spiegeleisen

The output of pig iron in January showed a falling off of only about 4200 gross tons daily from the December rate, 3,302,260 gross tons or 106,525 tons a day, being produced the past month, as compared with 110,762 daily or 3,433,617 gross tons in December. During January 35 furnaces were blown out and only 8 blown in, leaving 323 stacks with 104,180 gross tons estimated daily capacity in blast Feb. 1, as compared with 350 furnaces of 109,675 tons daily capacity active Jan. 1. Ferroalloy made in January amounted to 32,787 gross tons, of which 22,383 tons was ferromanganese.

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces for January and the three months preceding.

Pig-Iron Production by Districts—Gross Tons

	Oct.	Nov.	Dec.	Jan.
	(31 days)	(30 days)	(31 days)	(31 days)
New York	231,286	222,253	231,848	217,762
New Jersey	14,466	20,560	18,462	18,038
Lehigh Valley	128,897	119,846	127,646	93,948
Schuylkill Valley	75,959	87,336	96,813	95,234
Lower Susquehanna and Lebanon Valleys	94,350	87,884	76,640	55,221
Pittsburgh district	702,690	662,644	687,265	668,156
Shenango Valley	181,094	173,784	153,918	147,011
Western Pennsylvania	184,858	178,440	171,252	179,271
Maryland, Virginia and Kentucky	91,899	87,667	90,386	85,043
Wheeling district	142,059	126,602	134,046	141,066
Mahoning Valley	337,165	320,295	330,388	327,690
Central and Northern Ohio	295,409	297,027	301,622	311,322
Southern Ohio	75,661	61,064	67,272	65,274
Chicago district	560,839	551,651	587,709	564,494
Mich., Minn., Mo., Wis., Col. and Wash.	128,091	120,100	119,518	124,494
Alabama	215,631	206,368	208,151	181,313
Tennessee	26,557	30,555	30,681	26,923
Total	3,486,941	3,354,076	3,433,617	3,302,260

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from January, 1918, is as follows:

	Daily Rate of Pig-Iron Production by Months—Gross Tons		
	Steel Works	Merchant	Total
January, 1918	55,662	22,137	77,799
February	56,938	25,897	82,835
March	74,526	29,122	103,648
April	79,199	30,408	109,607
May	81,238	29,937	111,175
June	81,734	29,059	110,793
July	79,248	31,106	110,354
August	80,947	28,394	109,341
September	83,579	30,363	113,942
October	83,686	28,796	112,482
November	83,395	28,407	111,802
December	81,445	29,317	110,762
January, 1919	78,388	28,137	106,525

The figures for daily average production, beginning with January, 1913, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1913—Gross Tons

	1913	1914	1915	1916	1917	1918	1919
Jan.	90,172	60,808	51,659	102,746	101,643	77,799	106,525
Feb.	92,369	67,453	59,813	106,456	94,473	82,835	—
Mar.	89,147	75,738	66,575	107,667	104,882	103,648	—
Apr.	91,759	75,665	70,550	107,592	111,165	109,607	—
May	91,039	67,506	73,015	108,422	110,238	111,175	—
June	87,619	63,916	79,361	107,053	109,002	110,793	—
July	82,601	63,150	82,691	104,017	107,820	110,354	—
Aug.	82,057	64,363	89,666	103,346	104,772	109,341	—
Sept.	83,531	62,753	95,085	106,745	104,465	113,942	—
Oct.	82,133	57,361	100,822	113,189	106,550	112,482	—
Nov.	74,453	50,611	101,244	110,394	106,859	111,802	—
Dec.	63,987	48,896	103,333	102,537	92,997	110,762	—

The 35 blast furnaces blown out include No. 4 Lackawanna and No. 2 Donner in the Buffalo district; Burden in northern New York; Carbon and one Palmerston in Lehigh Valley; Temple in the Schuylkill Valley; Paxton and Vesta in the lower Susquehanna Valley;

one Shoenberger, No. 2 Isabella, No. 1 Lucy and No. 2 Eliza in the Pittsburgh district; Atlantic, Hall and No. 1 Shenango in the Shenango Valley; one Johnstown in western Pennsylvania; Buena Vista, Graham and old Dominion in Virginia; Norton in Kentucky; Steubenville in Wheeling district; Hannah in the Mahoning Valley; Newburgh and Franklin in northern Ohio; Portsmouth and No. 2 Wellston in southern Ohio; one Iroquois in the Chicago district; Trussville, one Woodward and Nos. 2 and 5 Bessemer in Alabama; Chattanooga, Cumberland and Standard in Tennessee.

The 8 furnaces blown in are No. 6 Lackawanna in the Buffalo district, Neville Island in the Pittsburgh district, one Maryland stack, one Central in northern Ohio, Belfont in southern Ohio, Zenith in Minnesota, Irondale in Washington and Woodstock in Alabama.

Capacity in Blast Feb. 1

The following table shows the number of furnaces in blast Feb. 1 in the different districts, also the number and daily capacity in gross tons of furnaces in blast Jan. 1:

Location of furnaces	Total Number of stacks	Feb. 1		Jan. 1	
		Number in blast	Capacity per day	Number in blast	Capacity per day
<i>New York:</i>					
Buffalo	21	18	6,195	18	6,456
Ferro	1	0	0	1	100
Other New York	4	3	525	4	650
New Jersey	5	3	555	3	495
<i>Pennsylvania:</i>					
Lehigh Valley	18	14	2,905	16	3,645
Spiegel	2	2	195	2	195
Schuylkill Valley	13	10	3,050	10	3,050
Spiegel	2	0	0	1	75
Lower Susquehanna	9	3	1,090	4	1,150
Ferro and Spiegel	2	1	40	2	95
Lebanon Valley	6	2	385	3	575
Ferro and Spiegel	4	3	250	2	150
Pittsburgh District	52	48	21,190	49	21,540
Ferro and Spiegel	5	2	320	3	530
Shenango Valley	19	14	4,470	17	5,975
Western Pennsylvania	25	19	5,010	21	5,410
Ferro and Spiegel	3	2	175	1	115
Maryland	4	4	1,200	3	950
Wheeling District	14	13	4,225	14	4,450
<i>Ohio:</i>					
Mahoning Valley	27	24	10,125	25	10,325
Central and Northern	26	24	9,785	25	10,025
Southern	17	12	1,680	14	2,200
Illinois and Indiana	41	38	18,350	39	18,860
Michigan, Wisconsin	13	10	2,850	9	2,700
Col., Mo., and Wash.	8	5	1,270	4	1,100
<i>The South:</i>					
Virginia	15	8	900	11	1,125
Ferro and Spiegel	4	2	100	3	120
Kentucky	7	4	525	5	750
Alabama	45	26	5,915	29	6,575
Ferro	1	1	95	1	95
Tennessee	16	8	805	11	1,000
Total	429	323	104,180	350	109,675

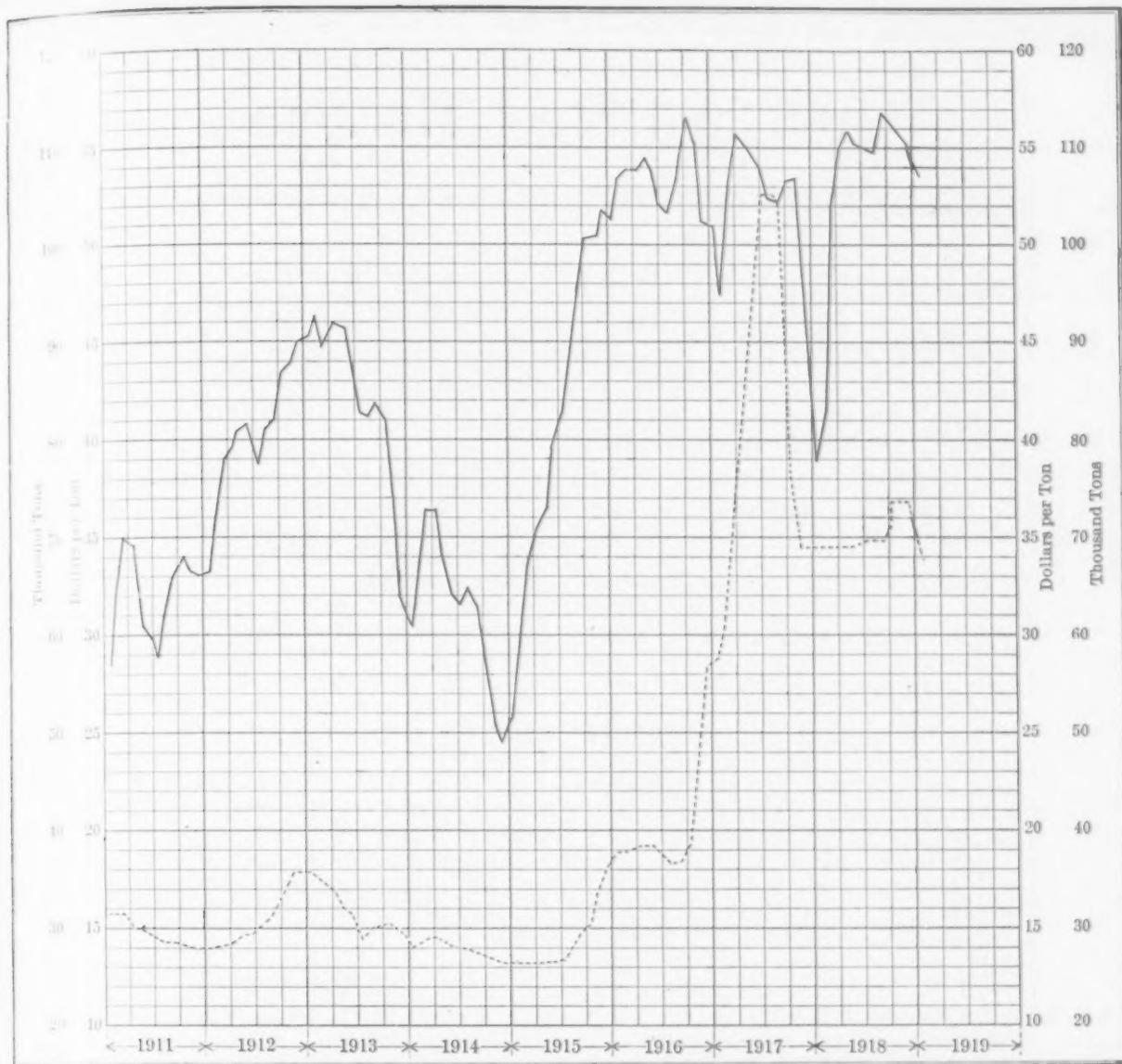
Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies show the following totals of steelmaking iron month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

	Production of Steel Companies—Gross Tons				
	Total Production		Ferromanganese		
	1917	1918	1919	1917	1918
Jan.	2,444,203	1,756,208	2,430,022	38,792	30,695
Feb.	1,829,846	1,620,254	—	32,137	26,114
Mar.	2,285,430	2,349,419	—	36,563	39,122
Apr.	2,370,937	2,411,488	—	39,595	35,511
May	2,404,380	2,513,577	—	37,701	54,633
June	2,304,155	2,407,166	—	30,829	44,844
July	2,369,630	2,456,693	—	43,884	51,762
Aug.	2,214,513	2,509,357	—	39,492	54,009
Sept.	2,198,705	2,507,381	—	42,235	66,275
Oct.	2,376,589	2,594,277	—	48,691	70,379
Nov.	2,349,545	2,501,867	—	34,685	59,638
Dec.	2,094,659	2,524,794	—	29,902	49,435

Diagram of Pig-Iron Production and Prices

The fluctuations in pig-iron production from 1910 to the present time are shown in the accompanying chart.



The Full Line Represents the Daily Production of Pig Iron and the Dotted Line Is the Average of the Price Per Ton of No. 2 Southern Pig Iron at Cincinnati, local No. 2 foundry iron at Chicago, and No. 2X iron at Philadelphia

The figures represented by the heavy line are those of daily average production by months of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnace at Chicago, and No. 2X at Philadelphia. They are based on the weekly market quotation of THE IRON AGE.

Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1915—Gross Tons

	1915	1916	1917	1918	1919
Jan.	1,601,421	3,185,121	3,150,938	2,411,768	3,302,260
Feb.	1,674,771	3,087,212	2,645,247	2,319,299	.....
Mar.	2,063,834	3,337,691	3,251,352	3,213,091	.....
Apr.	2,116,494	3,227,768	3,334,960	3,288,211	.....
May	2,263,470	3,361,073	3,417,340	3,446,412	.....
June	2,380,827	3,211,588	3,270,055	3,323,791	.....
July	2,583,420	3,224,513	3,342,438	3,420,988	.....
Aug.	2,779,647	3,203,713	3,247,947	3,389,585	.....
Sept.	2,852,561	3,202,366	3,133,954	3,418,270	.....
Oct.	3,125,491	3,508,849	3,303,038	3,486,941	.....
Nov.	3,937,308	3,311,811	3,205,794	3,354,074	.....
Dec.	3,203,322	3,178,651	2,882,918	3,433,617	.....
Total	36,662,566	39,039,356	38,185,981	38,506,249	.....

*These totals do not include charcoal pig iron. The 1917 production of this iron was 376,525 tons.

Arthur G. McKee & Co., contractors and engineers, Cleveland, have taken a contract for a 20 x 100-ft. hot-blast stove connecting mains and other works in connection with one of the blast furnaces of the Marting Iron & Steel Co., Ironton, Ohio.

Blast Furnace Notes

The Wellston Iron Furnace Co., which blew out both its furnaces at Wellston, Ohio, Jan. 5, for relining and other repairs, blew in No. 1 Feb. 1 after the installation of a new pumping outfit. It is planned to complete relining No. 2 and blow in about March 15.

The Seaboard Steel & Manganese Corporation blew out its No. 2 furnace at Temple, Pa., Jan. 8, and expects to blow in No. 1 in a few weeks.

Lochiel blast furnace, Harrisburg, Pa., has just entered the eighteenth month of continuous operation on ferromanganese. This is said to be a record for any furnace producing this alloy.

New Work at Blast-Furnace Plants

Freyn, Brassert & Co., engineers, People's Gas Building, Chicago, are supplying an 80-ft. Dorr thickener for the clarification of the waste water from two Brassert gas washing and drying units and recovery of the flue dust in connection with the installation of two blast furnaces at the River Rouge plant of the Ford Motor Co.

The company has been awarded the contract to license the Lackawanna Steel Co. to erect a Brassert gas washing and drying unit for No. 6 blast furnace, this making the fourth unit of its kind at the Lackawanna plant.

The same firm of engineers is designing and building for the Steel & Tube Co. of America, Mark plant, a blast furnace office and three service stations.

Iron and Steel Markets

STILL NO SIGNS OF BUYING

Ocean Freights Not Yet Favorable and Price Reductions Inconsequential

Wage Cut in Ore Region—500,000 Tons of Rails Needed—January Iron Output

No signs of a buying movement in either domestic or foreign trade are discernible. Though needs on all sides are admitted, no one seems to discover how to take the initiative to establish conditions attractive enough to result in a deal. There is every likelihood that the world's mental sickness following the shock of stopping the war will show no betterment before spring.

Further slight reductions in ocean freight rates are a help in the export outlook, but transportation costs four and five times the former normal charges lead to expectations of other downward readjustments. Pig iron sellers find their prices still higher than those quoted by English furnaces.

A straw in the drift toward lower iron and steel prices is the reduction in wages made in a few iron mines. The rates have been put back to the basis of September before the basic 8-hr. day was introduced and represent a cut of 10 to 16 2-3 per cent.

The numerous strikes all over the country are in the main ending without increasing the labor item of cost. But labor itself is undergoing readjustment so-called in that overtime is being widely eliminated, notably in the railroad service, where all possible Sunday work has been stopped.

Urgent needs are bringing forward delayed buying by the railroads. Besides cars and locomotives, 500,000 tons of rails are counted on. Some rail mills are without orders and none has more than four or five months' bookings.

On foreign account 62 locomotives have been sold for Africa and Argentina. Car builders are expecting a release on 20,000 cars for France postponed on the cessation of hostilities.

German steel output according to our London cable was about 16,500,000 tons in 1918 or about the same as 1917. A big Continental rail and construction material demand is reported.

Southern pig iron producers have generally agreed to revise their first-half of 1919 contracts to the \$31 basis, but are declining to make this reduction on the price of iron still unshipped on old contracts. Some Virginia furnaces have also reduced prices to this level, but without sales. The tonnage of iron being offered for resale is not large.

Though there were 27 less furnaces in blast at the end than at the beginning of January, the month's output of pig iron was 3,302,260 tons, a January record and a commentary on the unusually favorable weather. Daily production was 106,525 tons against 10,762 tons in December. This is smaller than any month last year except the first three, when the industry was throttled by the prolonged severe winter weather and the collapse of railroad transportation.

The smaller furnaces are gradually going out. The 323 furnaces in blast on Feb. 1 were operating at a total daily rate of 104,180 tons, or 323 tons per furnace. The 350 in blast on Jan. 1 were operating at 109,675 tons, or 313 tons per furnace, and the 360 on Dec. 1 at 111,330 tons, or 309 tons per furnace.

Activity in cast iron pipe in the West, with three municipalities figuring in it, is noteworthy, considering the general country-wide indifference.

In the same way may be mentioned an inquiry from the Hog Island shipyard for 1,000,000 bolts all of the one size.

What changes can take place in a short time is shown in the matter of plates, which are obtainable in one week. Mills recently filled with orders will run out in four or five weeks.

The latest movement to have Chicago re-established as a price basing point has crystallized into the organization of the Steel Tank Manufacturers' Association. The outlook is that it will receive substantial support from many buyers of iron and steel products in the Central West.

The supply of manganese ore and ferromanganese now in this country is estimated to be sufficient for 14 months' normal requirements.

Pittsburgh

PITTSBURGH, Feb. 4—(By Wire).

If anything, the local market is quieter at present than it has been at any time this year. New business in nearly all lines and also inquiry seem to be growing steadily less. An utter lack of confidence on the part of jobbers and consumers is shown as to the future of prices. New business is almost entirely for small lots. Many in the trade believe it will be well into summer before there is any permanent betterment in demand. Consumers and jobbers alike are working off heavy stocks of materials bought last fall in the expectation that railroad conditions in the winter might be much the same as last winter. The open weather is allowing the railroads to make prompt deliveries. There is also a strong feeling that present prices on nearly all lines from pig iron to the smallest finished steel products are high and that there will have to be materially lower prices before buying will begin. As against this mills point to the fact that it would be impossible to make any material reductions in prices in labor and in other costs, while present high prices of living continue. It is known that to many merchant blast furnaces \$30 pig iron does not leave very much profit, and this is also true to a large extent on prices of some finished steel products to the smaller producers who buy their steel in the open market. The recent reductions in ocean freights are of great interest to local producers of steel, but there has not been time enough yet to determine accurately whether these reductions in freights will result in more export business being placed with domestic mills. Usually one week is allowed for a cable quotation to be exercised, and mills rolling tin plate, sheets, wire rods, wire and wire nails and other finished products that have made quotations on export inquiries have not yet heard from most of these as to whether the prices quoted will take the business. Export inquiry on many lines of steel products is quite active, and the mills are anticipating de-

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron,	Feb. 4,	Jan. 28,	Jan. 7,	Feb. 6,
Per Gross Ton:	1919	1919	1919	1918
No. 1, Philadelphia	\$36.15	\$36.15	\$36.15	\$34.25
Valley furnace	31.00	31.00	33.00	
Southern, Cin'tif.	34.60	34.60	34.60	35.90
Birmingham, Ala.	31.00	31.00	31.00	33.00
Turnace, Chicago*	31.00	31.00	31.00	33.00
Basic, del'd, eastern Pa.	33.90	33.90	33.90	33.75
Basic, Valley furnace	30.00	30.00	33.00	
Rosemer, Pittsburgh	33.60	33.60	33.60	37.25
Malleable, Chicago*	31.50	31.50	31.50	33.50
Malleable Valley	31.50	31.50	31.50	33.50
Gray forge, Pittsburgh	31.40	31.40	31.40	32.75
Le. S. charcoal, Chicago	38.85	38.85	38.85	37.50

Rails, Billets, Etc.,

Per Gross Ton:				
Bessemer rails, heavy, at mill	\$55.00	\$55.00	\$55.00	\$55.00
O. H. rails, heavy, at mill	57.00	57.00	57.00	57.00
Rose billets, Pittsburgh	43.50	43.50	43.50	47.50
O. H. billets, Pittsburgh	43.50	43.50	43.50	47.50
O. H. sheet bars, P'gh.	47.00	47.00	47.00	51.00
Forging billets, base, P'gh.	56.00	56.00	56.00	60.00
O. H. billets, Phila.	47.30	47.30	47.30	50.50
Wire rods, Pittsburgh	57.00	57.00	57.00	57.00

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Common iron bars, Phila.	3.45	3.745	3.745	3.655
Common iron bars, P'gh.	3.50	3.50	3.50	3.50
Iron bars, Chicago	2.97	2.97	3.17	3.50
Steel bars, Pittsburgh	2.70	2.70	2.70	2.90
Steel bars, New York	2.97	2.97	2.97	3.095
Tin plates, Pittsburgh	3.00	3.00	3.00	3.25
Tin plates, New York	3.27	3.27	3.27	3.445
Beams, etc., Pittsburgh	2.80	2.80	2.80	3.00
Beams, etc., New York	3.07	3.07	3.07	3.195
Shear, grooved steel, P'gh.	2.70	2.70	2.70	2.90
Shear, sheared steel, P'gh.	3.00	3.00	3.00	3.25
Steel hoops, Pittsburgh	3.30	3.30	3.30	3.50

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Silicon, 1.75 to 2.25. \$2.25 to 2.75, silicon.

Sheets, Nails and Wire,	Feb. 4,	Jan. 28,	Jan. 7,	Feb. 6,
Per Lb. to Large Buyers:	1919	1919	1919	1918
Sheets, black, No. 28, P'gh.	4.70	4.70	4.70	5.00
Sheets, galv., No. 28, P'gh.	6.05	6.05	6.05	6.25
Wire nails, Pittsburgh	3.50	3.50	3.50	3.50
Cut nails, Pittsburgh	5.00	5.00	5.00	4.00
Fence wire, base, P'gh.	3.25	3.25	3.25	3.25
Barbed wire, galv., P'gh.	4.35	4.35	4.35	4.35

Old Material,

Per Gross Ton:				
Carwheels, Chicago	\$23.00	\$23.00	\$26.00	\$30.00
Carwheels, Philadelphia	23.00	23.00	25.00	30.00
Heavy steel scrap, P'gh.	15.00	16.00	20.00	30.00
Heavy steel scrap, Phila.	16.00	16.00	18.00	30.00
Heavy steel scrap, Ch'go.	15.00	15.50	18.00	30.00
No. 1 cast, Pittsburgh	19.00	21.00	25.00	30.00
No. 1 cast, Philadelphia	23.00	23.00	24.00	30.00
No. 1 cast, Ch'go (net ton)	19.50	20.50	24.00	26.00
No. 1 RR, wrot, Phila.	23.00	23.00	25.00	35.00
No. 1 RR, wrot, Ch'go (net)	15.50	15.75	21.50	31.25

Coke, Connellsville,

Per Net Ton at Oven:				
Furnace coke, prompt	\$5.00	\$5.00	\$6.00	\$6.00
Furnace coke, future	6.00	6.00	6.00	6.00
Foundry coke, prompt	5.00	5.00	7.00	7.00
Foundry coke, future	7.00	7.00	7.00	7.00

Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	19.50	20.00	21.00	23.50
Electrolytic copper, N. Y.	18.75	20.00	21.00	23.50
Spelter, St. Louis	6.35	6.75	7.50	7.75
Spelter, New York	6.70	7.10	7.85	8.00
Lead, St. Louis	4.75	5.00	5.45	6.85
Lead, New York	5.05	5.30	5.75	7.00
Tin, New York	72.00	71.50	71.50	85.00
Antimony (Asiatic), N. Y.	7.50	7.50	7.62 1/2	14.00
Tin plate, 100-lb. box, P'gh.	\$7.35	\$7.35	\$7.35	\$7.75

development of a large export trade in the near future.

The labor situation in the Pittsburgh district, which looked ominous several weeks ago, has quieted down, and it is not believed there will be any serious labor disturbances in this district. Here and there some adjustments in labor prices have been made, and most of these were after consultation with the men; they were shown clearly that they would have to take less wages if the plants of their employers were to be kept in operation.

Pig Iron.—The local market is devoid of large inquiry, and has been since the first of the year. Furnaces that have contracts on their books state that the consumers are taking the iron out fairly well, but in some cases requests have come in that shipments be held up. There is some inquiry for small lots of foundry and basic iron for prompt shipment, but there has not been enough inquiry for weeks to test out prices. A good many furnaces have gone out of blast in preference to piling iron at present high costs, and have taken advantage of the quiet market to reline and make other needed repairs. We note a sale of 200 tons of basic iron at \$30 and 150 tons of No. 2 foundry at \$31, Valley furnace, both for prompt shipment. It is said that so far very little iron has been piled by the furnaces. We repeat former prices as follows:

Basic pig iron, \$30; Bessemer, \$32.20; gray forge, \$30; No. 2 foundry, \$31; No. 3 foundry, \$30.50, and malleable \$31.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being \$1.40 per ton.

Ferroalloys.—There is no inquiry, all consumers being heavily stocked and a good deal of resale material is being offered at relatively low prices. Makers of ferromanganese have fixed the price of 70 per cent at \$225 with an additional charge of \$3 per unit over 70 per cent, but we do not hear of any sales being made. Resale ferromanganese has been freely offered at \$200 and even less, and resale 50 per cent ferrosilicon has been offered at \$125 or less, all consumers having stocked up heavily last fall in fear of a shortage with

a prolonged war and a repetition of the deplorable railroad conditions of last winter.

We quote 70 per cent ferromanganese at \$190 to \$200, delivered, and 16 to 18 per cent spiegelisen, \$60, f.o.b. furnace, an addition or deduction of \$3.50 per unit being made, when the manganese content is above or below the standard. Fifty per cent ferrosilicon is quoted at \$125.

We quote 9 per cent Bessemer ferrosilicon at \$52; 10 per cent, \$54; 11 per cent, \$57.30; 12 per cent, \$60.60. We quote 6 per cent silvery iron, \$29; 7 per cent, \$40; 8 per cent, \$42.50; 9 per cent, \$44.50; 10 per cent, \$47. Three dollars per gross ton advance for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, these furnaces having a uniform freight rate of \$2.90 per gross ton, for delivery in the Pittsburgh district.

Billets and Sheet Bars.—There is absolutely no new inquiry, nor has there been since the first of the year. Reports are going of steel being offered at less than recognized prices, but the mills and also the dealers say that a reduction of anywhere from \$3 to \$5 a ton would not result in any material increase in new business. It is said one or two small lots of resale billets are being offered at about \$2 a ton under the recognized price, which is \$43.50, Pittsburgh, but so far without any sales being made. The sheet and tin plate mills are running a little better than a month ago.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at \$43.50, sheet bars \$47, slabs \$46, and forging billets \$56 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Structural Material.—Local fabricators report new inquiry as very light, and say they have very little work ahead. Several of the larger fabricating shops are down to about a 40 per cent operation, and have recently let out a very large number of men. No local work of any magnitude is in sight and capital does not seem disposed to take up projects involving large quantities of steel on account of the high prices of labor and material. Railroads are placing only small orders for needed repair work.

We quote beams and channels up to 15 in. at 2.80c. at mill, Pittsburgh.

Plates.—Demand is dull and the present situation is in sharp contrast with the abnormal activity in plates

that prevailed over the last two years. The shipbuilding interests have taken a very large part of the shipments of plates now going out from the mills. The reported program of the Railroad Administration for railroad betterments is understood to include many thousands of steel passenger and freight cars, but how soon this may develop into actual orders is a good deal of a question.

Iron and Steel Bars.—Reports are current that several mills rolling iron bars are offering these on the basis of 2.70c. Pittsburgh for Western shipment and 2.90c. for Eastern shipment. These reports are not verified, but it is a fact that some bar iron mills are getting very short of work, demand having been dull for several months. Mills rolling steel bars state that demand is quiet, but that specifications against contracts placed last fall are coming in at a fair rate.

We quote soft steel bars rolled from billets at 2.70c. from old steel rails, 2.80c.; common iron bars, 3.50c.; bar iron rolled from selected scrap, 4.25c.; and refined iron bars at 5c. at mill, Pittsburgh.

Sheets.—Demand for sheets is fairly active, but is not as heavy as two or three weeks ago. Some sheet mills are slowing down in operations, stating that they are getting pretty close to the end of orders on their books, and that new business is not coming in at a satisfactory rate. Several of the larger sheet mills report they have enough orders to carry them until about March 1 and some until about March 15, but they have very little beyond the latter date. Independent sheet mills are operating at from 60 to 70 per cent of capacity. There are plenty of sheet bars, more than the mills can take in owing to the slowing down of new orders. Mills state they are holding prices firm, but some of the jobbers are cutting the market in a desire to move out stock more promptly.

Prices on sheets are given in detail on page 395.

Tin Plate.—Mills report fair specifications against contracts. But so far very few large consumers, like can makers and others, have placed contracts for their supply of tin plate for the first half of this year. A few companies are reported to have bought with the price fixed at \$7.35 per base box on shipment in first quarter, the price for second quarter shipment to be fixed later. Some consumers were anxious that the mills guarantee prices against decline, but all the mills refused to do this. There is a good deal of foreign inquiry, but very little export business is being closed. Some tin plate mills are operating to only 50 per cent of capacity, others 60 to 70 per cent, the general average not being over 60 per cent. We quote tin plate for domestic use at \$7.35 per base box, Pittsburgh. Prices on terne plate are given in detail on page 395.

Wire Rods.—Local mills rolling wire rods report a fairly active inquiry and we note a sale of 300 tons and another of 500 tons of soft open-hearth rods at the full price of \$57 f.o.b. mill, Pittsburgh. There is also an active foreign inquiry for rods, but very little business is being closed, probably due to the fact that mills quote \$10 or more per ton higher on export inquiries than domestic prices. It is likely the rod mills will soon quote very close to domestic prices on export inquiry. None of the rod mills in this district is operating to more than 50 to 60 per cent of capacity, all having plenty of steel but are short of orders. Prices on different grades of rods are given on page 395.

Wire Products.—Mills report that jobbers and consumers are buying wire and wire products only in such quantities as they must have for actual needs. It is a question now largely of shipments, and where the mill now promises quick shipment it gets the preference in securing the business. A peculiar condition has come up in the wire nail trade, the War Department being in the market for kegs of n's, while last week the Government reported that it had on hand nearly 160,000 kegs. The question now is, among the makers of wire nails, why the War Department does not get its nails direct from the Government stock; local mills are quoting on this inquiry the price of \$3.50 base per keg. Railroads are buying a little more freely, one company having taken lately 3000 kegs or more of wire nails from a leading railroad for prompt shipment. Mills say they are not shading prices, and if this is being

done it is by jobbers who may desire to move out stocks more quickly. Prices on wire products are given in detail on page 395.

Hot Rolled Strip Steel.—The demand is only for small lots to meet actual needs. Specifications are fairly good on the contracts placed last year, on which shipments were delayed on account of Government needs.

We quote hot-rolled strip steel, as made by hoop and band mills, at 3.30c. per lb., while for deep stamping or drawing quality steel, 50c. per 100 lb. extra is charged, all f.o.b. Pittsburgh.

Cold Rolled Strip Steel.—Jobbers and consumers are buying only in small lots to meet current needs, and no contracts are being made. Specifications against contracts placed late last year are coming in at a fair rate. The automobile trade is said to be placing orders more freely than for some time.

We quote cold-rolled strip steel at \$6.25 base per 100 lb. f.o.b. Pittsburgh, for 1½-in. and wider, 0.100 in. and thicker hard tempered in coils under 0.20 carbon. Boxing charge 25c. per 100 lb.

Shafting and Screw Stock.—Makers report the demand only fair. The automobile trade and the screw stock people are placing orders only for such quantities of material as they must have to cover current needs and there is no buying for delivery ahead. Reports were current here last week that several makers had increased their discount on cold rolled shafting from 21 to 25 per cent off in carload lots, but careful investigation showed this report to be untrue. All the local makers of shafting say they are holding firm at the regular discounts of 21 per cent off for carloads and 16 per cent in less than carloads, f.o.b. Pittsburgh.

We quote cold-rolled shafting at 20 per cent off list in carloads and 16 per cent in less than carloads, f.o.b. Pittsburgh.

Nuts and Bolts.—The makers report a fair demand from jobbers and consumers, but this is largely for such quantities as are required to meet current needs. Jobbers' stocks are fairly heavy and there is no longer any delay in shipments, so that there is not the incentive to buy ahead that existed some time ago. In addition to this the chances favor lower prices on nuts and bolts, and jobbers and consumers had this in mind when placing orders. Makers claim discounts are being firmly held and these are given in detail on page 395.

Rivets.—Local makers of rivets claim that while new business is light they are holding prices firm. The demand from the shipbuilding yards is fairly heavy, but from locomotive and boiler shops is only fair. The makers have enough orders to take care of their output for about a month ahead, but very little beyond that date. Operations are on a 50 to 60 per cent basis.

We quote button head structural rivets at \$4.40 and cone head boiler rivets at \$4.50 base, f.o.b. Pittsburgh.

Spikes.—Three or four railroads came in the market recently for fairly large quantities of spikes, but after prices had been quoted on these the railroads placed only very small orders for prompt shipment. It is expected, however, that the Railroad Administration, if it goes through with its construction program that is now being talked about, will be a very heavy buyer of spikes later on. The demand for boat spikes is fairly active.

We quote standard spikes 9/16 x 4½ in. at \$3.65 and small spikes at the same price in carload lots of 200 kegs or more at \$3.65 per 100 lb., plus usual extras. We quote boat spikes at \$5.00 base per 100 lb. plus usual extras in carload lots of 200 kegs or more, all f.o.b. Pittsburgh.

Hoops and Bands.—The demand is light and only for small lots to meet actual needs. Specifications against contracts placed last year, on which prices were readjusted, are fairly active.

We quote steel hoops and bands at 3.30c. base, with the usual extras.

Wrought Pipe.—Makers report the demand for lap weld sizes of pipe to be very active, and say they have several months' work ahead on this, but demand for butt-welded sizes is very quiet. As yet none of the large inquiries for line pipe, noted two weeks ago, has been closed, but it is said chances are very good for a large tonnage of line pipe to be placed with the mills

in the near future. Pipe mills are operating from 70 to 80 per cent capacity, and have a fair amount of work ahead. Demand for oil country goods is heavy and development work in the ranger and other oil fields in Texas and Oklahoma is active, and promises to be for a long time. If one-half of the lines now talked of for various gas and oil projects is placed it will mean many thousands of tons of pipe for the mills. The Philadelphia Co. is expected to close shortly for its requirements of tubular goods for this year, which are said to amount to 10,000 to 12,000 tons. Discounts on iron and steel pipe are given on page 395, and it is stated these are firmly held by the mills, but are being shaded more or less by some jobbers to more rapidly move out stocks.

Skelp.—Several makers report a more active new demand for skelp than for some time, and prices are reported as holding firm.

We quote grooved skelp at \$2.65, universal skelp, \$3.00 base; special skelp for boiler tubes, etc., is \$3.15 for base sizes and \$3.30 for other sizes, all these prices being per 100 lb. f.o.b. Pittsburgh.

Boiler Tubes.—The demand for merchant and locomotive tubes is light and some mills rolling iron tubes are down to about a 50 per cent operation. Locomotive and boiler shops are slowing down in operations, and this is causing a heavy falling off in demand for tubes. Discounts on iron and steel tubes are given on page 395.

Old Material.—The market is steadily settling to still lower prices. Some makers of scrap that do not have storage facilities are importuning dealers to try to sell it for them at the best prices they can get, and this is adding to the demoralization in prices. None of the large consumers of scrap is in the market, and probably will not be for some time. Occasionally a consumer will take in a small amount of scrap merely as an accommodation to the dealer with whom he has been doing business and not because he needs the scrap. One such sale was made lately of 500 tons of selected heavy steel scrap at \$15 per gross ton, delivered at consumer's mill. There is very little demand for borings and turnings, the two leading consumers at West Brackenridge offering about \$11 for borings and about \$9 for turnings. It is the general belief here that prices on scrap will go still lower before there is any general buying movement. Should prices go much lower some dealers are inclined to load up, believing the market will take a turn for the better before long.

Heavy steel melting, Steubenville, Fallsburg, Brackenridge, Monessen, Midland and Pittsburgh, delivered	\$15.00 to \$16.00
No. 1 cast, for steel plants (nominal)	19.00 to 20.00
Bundled rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	20.00 to 21.00
Compressed steel	14.00 to 15.00
Bundled sheet, sides and ends, f.o.b. consumers' mills, Pittsburgh district	12.50 to 13.00
Bundled sheet stampings	12.50 to 13.00
Railroad grate bars	13.00 to 14.00
Low phosphorus melting stock	20.00 to 21.00
Low phosphorus bloom and billet ends and heavy plates	22.00 to 23.00
No. 1 busheling	15.00 to 16.00
Iron car axles	37.00 to 38.00
Locomotive axles, steel	36.00 to 37.00
Steel car axles	38.00 to 39.00
Railroad malleable	18.00 to 19.00
Machine shop turnings	9.00 to 10.00
Cast iron wheels	22.00 to 23.00
Bored steel wheels	18.00 to 19.00
Sheet bar crop ends (at origin)	22.00 to 23.00
Heavy steel axle turnings	12.00 to 12.50
Heavy breakable cast	20.00 to 21.00
Cast iron borings	11.00 to 12.00
No. 1 railroad wrought	25.00 to 26.00

Coke.—There is no betterment in demand for furnace and foundry coke and prices are very weak. Standard brands of 48-hr. furnace coke are offered freely at \$5 per ton, but such coke loaded on cars that has to be moved is being offered at \$4.50 or lower. Output of coke has been going down for the past two or three weeks, due to the limited demand, and some of the smaller coke works, with high costs, have shut down entirely, stating they cannot make blast furnace or foundry coke at \$5 a ton and come out whole. Some

contracts for furnace coke at the flat Government price are still in force at \$6 a ton and will run until June 30, but on other contracts the prices are to be adjusted from month to month, based on the average selling price in each month during the life of the contract. There is a surplus of labor in the coke regions, and it is said several companies are seriously considering making a reduction in wages of coke workers, because of the heavy declines in prices of coke. Output of coke in the upper and lower Connellsville regions for the week ending Jan. 25 was 277,324 tons, a decrease over the previous week of 14,000 tons. We quote standard brands of 48-hr. furnace and 72-hr. foundry coke at \$5 per net ton at oven, but some grades of furnace coke running high in sulphur and not regarded as strictly standard can readily be bought at \$4 per ton at oven. A very large amount of coke is loaded on cars at various works awaiting destination and some of this coke is likely to be sold at very low prices in order to save demurrage charges.

British Iron and Steel Market

Continental Demand — More Shipbuilding at Vancouver — German Steel Output

(By Cable)

LONDON, ENGLAND, Feb. 4.

The labor situation, if anything, is worse. Pig iron is in large demand, and there are insufficient supplies, especially of foreign iron, and the undertone is strong. Ferromanganese is £35, f.o.b. works.

For the Continent there is a big demand for rails and construction material, but works are in the throes of transition from war to peace-time pursuits.

Tin plates are strong, America taking orders for Japan and Singapore at about 10 per cent under Wales. Contracts for steel for India have been canceled, causing concern. America seems anxious to sell.

The strikes here are causing unsettlement. Yarrow & Co., shipbuilders, will reduce output here and increase it at Vancouver.

German steel production for the January-October period, 1918, was 13,757,000 tons, compared with 16,587,000 tons for the year 1917; 16,182,000 tons for 1916; 13,258,000 for 1915, and 14,973,000 for 1914. The figures for the Stahlwerks Verband output are: Semi-finished steel: 10 months of 1918, 3,163,000 tons; year of 1917, 3,146,000; 1916, 2,202,000. Railroad material: 10 months, 1918, 886,000 tons; 1917, 1,007,000 tons; 1916, 1,181,000 tons. Shapes: 10 months, 1918, 339,000 tons; 1917, 609,000 tons; 1916, 781,000 tons.

The Thyssen works at Hadendingen are reported sequestered by the French but are still operating. The Verband is said to have authorized reduction of export prices if necessary to secure orders.

Following are the government fixed prices for steel per gross ton except where otherwise stated, f.o.b. makers' works, the figures in parentheses being the official domestic prices and the others the official export prices:

Hematite pig iron: East Coast, £8 12s. 6d. (£6 2s. 6d.); West Coast, £8 17s. 6d. (£6 7s. 6d.).
Ship, bridge and tank plates, £16 10s. (£14).
Boiler plates, £17 10s. (£15).
Ship, bridge and tank plates, thin, £19 10s. (£16).
Small angles, tees and flats, £20 (£16 10s.).
Beams, £16 2s. 6d. (£13 12s. 6d.).
Rails, 60 lb. per yd. and upward, £15 10s. (£13 7s. 6d.).
Rounds, squares and hexagons, £17 10s. (£14 5s.).
Billets and slabs for rolling, £13 10s. (£11 12s. 6d.).
Billets and slabs for forging, £15 (£12 15s.).
Bar iron, £20.
Tin plate, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 40s. to neutral countries; otherwise, 33s. 3d.
Tin plate bars (£12 5s. 9d.).

The John N. Willys Export Co. has been incorporated in Delaware, with capital of \$100,000, by John N. Willys of the Overland Motor Co., Toledo, Ohio, and associates, to engage in export work for his various interests.

Chicago

CHICAGO, Feb. 4 (By Wire).

In neither the steel nor pig iron situations is there anything to excite enthusiasm. The position of the former is the better of the two. Though consumers are not buying much more steel than they were, there is a little better feeling, some saying they will act soon, probably because they will be forced to do so. In plates there is a goodly tonnage wanted for various purposes, but prospective buyers are slow to move. The leading interest continues to run full in most departments, but its shipments are double its new business and there must be an end to this. The answer is that when consumers can no longer specify they will order again or they cannot continue to operate. The leading independent is running about 60 per cent, for which the slowing down of its large structural mill is largely responsible. Current orders have so far kept its sheet mills running full. No projects involving shapes are reported.

Perplexing demands for cancellations and suspension of deliveries continue to harass the pig iron producers. Inquiries are almost nil, and new business is practically confined to buying of high silvery iron. A steel company, not ordinarily a merchant seller, has some foundry iron of which it desires to dispose. Resale iron is easily located, but not much is offered because of the lack of demand.

Scrap continues to decline, sales being confined to transactions in which the buyer makes the price.

The steel trade in general is satisfied with the withdrawal of the proposed uniform contract. It was not acceptable to customers or the selling and operating branches of the mills.

Ferroalloys.—But little can be written of a market that is dormant. In the absence of any test, nominal quotations stand.

We quote 70 per cent ferromanganese nominal at \$200 to \$225 delivered; 50 per cent ferrosilicon at \$125 to \$130, delivered, and 16 to 18 per cent spiegeleisen at \$65 furnace.

Plates.—The mills are running full, but unless there is influx of new business they will run out of orders in the course of four or five weeks. The export situation is unchanged, lower freight rates not yet having made themselves felt. Inquiry represents a goodly tonnage required for ships, tanks, export, etc., but it does not come to fruition.

The mill quotation is 3c. Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 4.27c. for plates out of stock.

Pig Iron.—The conspicuous feature of the situation is that melters have plenty of iron in their yards and more under contract, but are not busy and see but little activity in prospect. Both melters and producers and the latter's agents are faced with many perplexing problems. The producers are receiving requests to hold up delivery and demands for cancellation are on the increase. Against the latter the furnaces have taken a firm stand, but there is no question that if some founders are compelled to accept iron, a hardship is inflicted on them. Some of the Southern and Virginia makers are steadfast in their determination to give no concessions in the matter of prices, although one important company is expected to make an announcement in this regard in a day or two. Several interesting cases are cited, as in the case of the foundry which, failing to get deliveries on its contracts in the third quarter of last year, entered the market and bought for its needs. Since then its war contracts have been canceled and now it is faced with the statement that it must take the iron which it should have received last year. Another is that of a melter who after protest agreed to accept iron, with the result that he has a six months' supply in his yard and a year's supply under contract and very little work in his shop. Little resale iron is being offered, because it is evident there is no one to take it. Under these conditions it follows there are but few inquiries and fewer sales, although there is some demand for 4 to 8 per cent silvery. A lot of 600 tons of silvery was taken by one consumer to-day, the reduced price applying. The leading local independent steel producer made a little high manganese foundry

iron last month and is seeking to place it at the full price rather than pile it. Another steel company which does a merchant business in iron is anxious to move malleable or standard Bessemer. Iron men point out that the entire situation is one for calm and compromise. Prices are unchanged.

The following quotations are for iron delivered at consumer's yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5..	\$38.70	to \$39.00
Lake Superior charcoal, C to AA....	40.70	to 42.50
Lake Superior charcoal, No. 6.....	41.20	to 41.50
Northern coke foundry, No. 1 silicon, 2.25 to 2.75	32.25	
Northern coke foundry, No. 2 silicon, 1.75 to 2.25	31.00	
Northern high-phosphorus foundry.....	31.00	
Southern coke, No. 1 foundry and No. 1 soft silicon, 2.75 to 3.25.....	32.00	
Southern coke, No. 2 foundry, silicon, 2.25 to 2.75	37.25	
Southern foundry, silicon, 1.75 to 2.25.....	36.00	
Malleable, not over 2.25 silicon.....	31.50	
Standard Bessemer	32.20	
Basic	30.00	
Low phosphorus (copper free)	32.50	
Silvery, 7 per cent.....	47.00	

Structural Material.—No building projects have yet taken definite form, despite all the talk of public improvements, and the mills do not expect activity for some time. Large shapes are in very slight demand as a result. The Bettendorf Co. will supply 1000 underframes to the St. Paul Railroad.

The mill quotation is 2.80c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 4.07c. for material out of warehouse.

Cast Iron Pipe.—Detroit placed 2000 tons with James B. Clow & Sons, Toledo, Ohio, has yet to place the 1000 tons for which it inquired, and Minneapolis, Minn., is in the market for 1300 tons.

We quote per net ton, f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., \$64.80; 6-in. and larger, \$61.80; class A and gas pipe, \$1 extra.

Bars.—The mills are in a better position with regard to mild steel bars than in most other products, and have enough on their books to last about two months. Considerable foreign inquiry is coming out, but orders hang fire. In bar iron only stray orders are being received.

Mill prices are: Mild steel bars, 2.70c., Pittsburgh, taking a freight rate of 27c. per 100 lb.; common bar iron, 2.97c., Chicago; refined iron bars, 3.65 to 4.40c.; rail carbon, 2.80c., Pittsburgh.

Sheets.—While the mills have no back-log and are therefore operating in a hand-to-mouth manner, they are running full on the specifications that are coming to them.

Chicago delivery out of stock regardless of quantity, No. 10 blue annealed, 5.17c.; No. 28 black, 6.22c., and No. 28 galvanized, 7.57c.

Mill quotations are 4.70c. for No. 28 black, 3.95c. for No. 10 blue annealed, and 6.05c. for No. 28 galvanized.

Wire Products.—Business is called neither good nor bad, and the market is devoid of features. Considering the volume of prompt delivery business being done, the wire mills are probably in a better position than those making other products.

Bolts and Nuts.—Small orders and many of them are keeping the makers fairly busy.

Structural rivets, 5.67c.; boiler rivets, 5.77c.; machine bolts up to $\frac{3}{8}$ x 4 in., 40 per cent off; larger sizes, 25 and 5 off; carriage bolts up to $\frac{3}{8}$ x 6 in., 35 off; larger sizes, 20 and 5 off; box pressed nuts, square topped, 78c. off; hexagon tapped, 58c. off; coach or lag screws, gimlet points, square heads, 40 per cent off. Quantity extras for nuts are canceled.

Rails and Track Supplies.—The railroads are taking deliveries of rails and track fastenings, but they are not buying. They have no need to buy in view of the mills being months behind on rail deliveries.

Standard railroad spikes, 3.65c., Pittsburgh. Track bolts with square nuts, 4.90c., Pittsburgh. Tie plates, steel, 3c., Pittsburgh and Chicago; tie plates, iron, 3.30c., f.o.b. maker's mills. The base for light rails is 3c., f.o.b. maker's mill, with usual extras.

Old Material.—Further price declines are shown in a market that continues almost lifeless. The only buying reported is that done by one consumer which has continued to take small lots at its own figure and has steadily reduced its offers. In general the situation is

one of waiting on the part of both dealers and consumers. There has again been established a differential of \$1 per ton between heavy melting and shoveling steel. Railroad offerings are more liberal, lists having come from the Northwestern, Pennsylvania, Erie, C. B. & Q., and New York Central Lines.

We quote for delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Iron rails	\$23.00 to \$24.00
Rebar rails	50.00 to 55.00
Car wheels	23.00 to 24.00
Steel rails, rerolling	17.00 to 18.00
Steel rails, less than 3 ft.	17.00 to 18.00
Heavy melting steel	15.00 to 16.00
Heavy switches and guards, cut apart	15.00 to 16.00
Shoveling steel	14.00 to 15.00
<i>Per Net Ton</i>	
Iron angles and splice bars	\$21.00 to 22.00
Steel angle bars	14.00 to 15.00
Iron arch bars and transoms	22.50 to 23.50
Iron car axles	31.00 to 32.00
Steel car axles	27.00 to 28.00
No. 1 railroad wrought	15.50 to 16.00
No. 2 railroad wrought	14.50 to 15.00
Cast forge	14.50 to 15.00
Pipes and flues	12.00 to 13.00
No. 1 busheling	13.50 to 14.00
No. 2 busheling	8.00 to 8.50
Sheet knuckles and couplers	18.00 to 18.50
Coil springs	18.00 to 18.50
No. 1 cast	19.50 to 20.00
Bolts, punchings	19.00 to 20.00
Locomotive tires, smooth	22.00 to 23.00
Machinist shop turnings	6.00 to 7.00
Cast turnings	9.50 to 10.50
Shovel plate and light cast	15.50 to 16.00
Grate bars	13.50 to 14.00
Brake shoes	13.50 to 14.00
Railroad malleable	14.50 to 15.50
Agricultural malleable	13.50 to 14.00
Country mixed	11.00 to 12.00

Philadelphia

PHILADELPHIA, Feb. 4.

Business is extremely quiet in all branches of the iron and steel industry. Orders are for small lots, and the aggregate tonnage being booked by the mills is not sufficient to justify the hope that mill operations can continue for long at the present rate of about 60 per cent.

At least one Virginia furnace has lowered its quotation from \$34 to \$31, f.o.b. furnace, for No. 2 plain iron, and others are expected to take similar action soon. It is reported by consumers that a few Eastern bar iron rolling mills are now quoting common merchant iron on the basis of 2.90c., Pittsburgh, for Eastern shipments, and 2.70c., Pittsburgh, on Western shipments. The larger mills are still adhering to the basis of 3.50c. On an inquiry for 400 tons of light rails, most of the mills quoted 2.75c., Pittsburgh, but one quotation was received at 2.60c. for rails rerolled from old rails. Several plate mills are urgently in need of business, and the trade expects there may be shading of prices within the near future.

An inquiry for 1,000,000 bolts of one size has been put forth by the American International Shipbuilding Corporation. Demand for bolts, nuts and rivets, particularly from shipyards, is greatly improved. There are reports of extra discounts being given on desirable business.

Pronounced weakness in scrap continues. A leading consumer in the East is now offering only \$15, delivered, for No. 1 heavy melting steel, and \$8, delivered, for blast furnace borings and turnings.

Ore.—Manganese ore is a drug on the market. Receipts from Brazil and Cuba on contract are far in excess of requirements. Ore arriving on contracts was sold at about \$1.30 per unit, but resale lots could undoubtedly be obtained at 70c. or less, according to brokers. No sales are reported. A cargo of 2850 tons of manganese ore from Cuba valued at \$71,250 was received at this port last week.

Ferroalloys.—Producers continue to quote \$225, delivered, for 70 per cent ferromanganese and \$60 to \$65 for 16 to 18 per cent spiegeleisen, f.o.b. furnace, but no business is being done. Small resale lots are reported to have been disposed of at around \$200. In some quarters it is estimated that the supply of ferromanganese

and manganese ore now in this country is sufficient to answer normal requirements for 14 months.

Pig Iron.—One or two Virginia furnaces are now quoting on the basis of \$31, f.o.b. furnace, for No. 2 plain iron, 1.75 to 2.25 per cent silicon, a reduction of \$3. Some of the Virginia furnaces, however, continue to quote on the \$34 basis. The differentials established during the war will be maintained, the extra for No. 2X iron (2.25 to 2.75 silicon) being \$1.25 per ton above base and that for iron analyzing 2.75 to 3.25 per cent silicon being \$3 per ton above base. It has been apparent that Virginia furnaces would find it necessary to lower their prices to compete with eastern Pennsylvania furnaces, which are now generally quoting at a \$3 reduction from the last Government schedule. No business of importance is being done. A few consumers who have recently inquired for fair-sized tonnages have closed only for small portions of the tonnages on which they asked for quotations. There are reports of resales of iron at below present furnace quotations, but little definite information is to be had regarding such transactions. We quote standard grades of iron delivered in the Philadelphia district, except standard low phosphorus, which is quoted f.o.b. furnace:

Eastern Penna. No. 2 X (2.25 to 2.75 sil.)	\$36.15
Eastern Penna. No. 2 plain (1.75 to 2.25 sil.)	34.90
Virginia No. 2 (2.25 to 2.75 sil.)	\$36.35 to \$39.35
Virginia No. 2 plain (1.75 to 2.25 sil.)	35.10 to 38.10
Basic	33.90
Gray forge	33.90
Standard low phosphorus, f.o.b. furnace	51.00
Copper-bearing low phosphorus	48.90

Plates.—Several Eastern plate mills are urgently in need of business, and the trade looks for shading of the present quotation of 3c., Pittsburgh, in the near future. Some mills are still running fairly full on ship, car and locomotive plates. Deliveries are to be had in one or two weeks on small tonnages.

Structural Material.—Plans are out for the new municipal pier, Philadelphia, which will require several thousand tons of steel. The city of Philadelphia will probably be in the market soon for a considerable tonnage for elevated extensions. The Newport News Shipbuilding & Dry Dock Co., Newport News, Va., will proceed with the erection of a large boiler shop at Richmond, Va., the contract for which was let last year to the McClintic-Marshall Co. We quote plain material at 2.80c., Pittsburgh, with a freight rate of 24½c. to Philadelphia.

Bars.—Consumers report that a few Eastern mills are now quoting 2.70c., Pittsburgh, for common merchant iron on Western shipments and 2.90c., Pittsburgh, on Eastern shipments. Small sales have been made on this basis. A majority of the iron rolling mills, however, still adhere to the 3.50c. quotation, which means that they have practically withdrawn from the market. The disparity between the Eastern quotation of 3.50c., Pittsburgh, and the 2.70c. price now quoted by Chicago mills is illustrated by the fact that bar iron delivered in Chicago at 2.97c., including Pittsburgh freight, could be reshipped to Philadelphia at a delivered price of 3.42c., compared with 3.745c., quoted by the Eastern mills. Some sellers expect that the 2.90c. Pittsburgh price, or 3.145c., Philadelphia, will soon become general. Jobbers, especially in New England, are placing orders rather fully for steel bars at 2.70c., Pittsburgh.

Bolts, Nuts and Rivets.—Inquiry is improving, especially from shipyards. One inquiry now before the mills is for 1,000,000 ½ x 3 in. bolts, about 500 tons, for the American International Shipbuilding Corporation, Philadelphia. The prices being quoted are generally the same as the last Government schedule, but on desirable business an extra 5 per cent discount is sometimes offered.

Rails.—On a domestic inquiry for 400 tons of light rails, most of the mills are reported to have quoted 2.75c., Pittsburgh, but one quotation of 2.60c., Pittsburgh, was received for rails rerolled from old rails. There is no inquiry reported for heavy rails, but the city of Philadelphia is expected to inquire soon for several thousand tons, with track fastenings, for elevated railroad extensions. We quote heavy open-hearth rails at \$57 f.o.b. mill, and Bessemer rails at \$55, f.o.b. mill.

Billets and Slabs.—A small tonnage of slabs for re-rolling into plates was sold last week at \$46, Pittsburgh, plus a \$3.80 freight rate. The market for billets is extremely quiet. We quote open-hearth billets at \$47.30, Philadelphia.

Old Material.—Dealers report that there have been virtually no sales during the past week. A large Eastern consumer is now offering \$15, delivered, for No. 1 heavy melting steel, and \$8, delivered, for blast furnace borings and turnings. No sales at these prices have been made at this writing. Some dealers believe that prices will not go lower, and a few are holding for \$17 to \$18 for heavy melting steel. Many producers are now permitting scrap to accumulate rather than sell at present prices. The War Department is preparing to dispose of its large scrap accumulations, and anticipation of these offerings is a decidedly weakening influence. Basic open-hearth steel plants are now using a much larger proportion of scrap in their mixtures, as much as 70 per cent scrap to 30 per cent hot metal being used in some instances. In general, the present practice is about 60 to 70 per cent scrap, as compared with 40 to 50 per cent of scrap used during the war period. At the present price for scrap, this represents a saving in the cost of mixtures of approximately \$10 or more a ton. Scrap dealers argue from this that a better demand for heavy melting steel, with a stiffening of prices, should develop when present scrap piles are worked down. We quote for delivery at consumers' works, Eastern Pennsylvania, as follows:

No. 1 heavy melting steel.....	\$16.00 to \$17.00
Steel rails, rerolling.....	18.00 to 20.00
No. 1 low phosphorus, heavy, 0.04 and under.....	22.00 to 24.00
Iron rails.....	30.00 to 32.00
Carwheels.....	23.00 to 25.00
No. 1 railroad wrought.....	23.00 to 24.00
No. 1 yard wrought.....	20.00 to 21.00
Country yard wrought.....	12.00 to 15.00
No. 1 forge fire.....	15.00 to 16.00
Bundled skeleton.....	15.00 to 16.00
No. 1 busheling.....	18.00 to 19.00
No. 2 busheling.....	14.00 to 15.00
Turnings (for blast furnace use).....	9.00 to 10.00
Machine-shop turnings (for rolling mill use).....	10.00 to 11.00
Cast borings (for blast furnace use).....	10.00 to 12.00
Cast borings (clean).....	13.00 to 15.00
No. 1 cast.....	23.00 to 24.00
Grate bars.....	18.00 to 20.00
Stove plate.....	18.00 to 20.00
Railroad malleable.....	18.00 to 20.00
Wrought iron and soft steel pipes and tubes (new specifications).....	18.00 to 20.00
Ungraded pipe.....	14.00 to 16.00

Buffalo

BUFFALO, Feb. 3.

Pig Iron.—The market continues quiet, with most consumers apparently playing a waiting game as regards new buying and there are no inquiries of consequence before the market. Buying is confined almost entirely to carloads. Producers, however, expect a better market later this month, as there are some indications of an improvement in demand developing within the next few weeks and the belief is strong that the present traces of stagnation will disappear and that business will go along satisfactorily. We quote the current price schedule as follows, f.o.b. furnace, Buffalo:

No. 1 foundry, 2.75 to 3.25 silicon.....	\$34.00
No. 2 X, 2.25 to 2.75 silicon.....	32.25
No. 3 foundry, 1.75 to 2.25 silicon.....	31.00
Gray forge.....	30.00
Malleable silicon not over 2.25.....	31.50
Basic, 1 to 1½ per cent mng.....	30.50
Basic, 1½ to 2½ per cent mng.....	30.00
Bessemer.....	32.20
Lake Superior charcoal, regular grades, f.o.b. Buffalo.....	38.50

Finished Iron and Steel.—A considerable aggregate of business is coming in right along, consisting principally of small lots for immediate uses. A good number of carload lots in bars and plates have been placed with mills that could guarantee quickest delivery, and some small orders for plates for immediate delivery have also been placed. A limited tonnage of plates for shipment into Canada has been taken by one local producer. It is stated that the new Consolidated Steel

Co. will handle all of the Canadian business for its constituent companies.

Old Material.—The market shows very little evidence of life, as there is an almost entire absence of demand. There has not been enough business transacted to establish more than a nominal schedule of prices, but the scale is not quotably lower than a week ago, as for the first time in several weeks no reductions in the nominal prices of the various grades of scrap are reported. Most dealers seem to believe that the end of the price toboggan has been reached and that there will be very little, if any, further downward trend. We quote the nominal price schedule, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel, regular grades.....	\$14.00 to \$15.00
Low phosphorus, 0.04 and under.....	19.00 to 20.00
No. 1 railroad wrought.....	18.00 to 19.00
No. 1 machinery cast.....	21.00 to 22.00
Iron axles.....	23.00 to 24.00
Steel axles.....	23.00 to 24.00
Carwheels.....	21.00 to 22.00
Railroad malleable.....	19.00 to 20.00
Machine shop turnings.....	7.50 to 8.00
Heavy axle turnings.....	13.00 to 14.00
Clean cast borings.....	11.00 to 12.00
Iron rails.....	21.00 to 22.00
Locomotive grate bars.....	16.00 to 17.00
Stove plate.....	16.00 to 17.00
Wrought pipe.....	13.00 to 14.00
No. 1 busheling.....	13.00 to 14.00
Bundled sheet stamping.....	11.00 to 12.00

British Steel Market

Regulation of Stocks of Iron and Steel—Demand for Pig Iron Good—New Companies

(By Mail)

LONDON, ENGLAND, Jan. 7.—The holidays were prolonged this year longer than usual and opportunity has been taken to overhaul plants and carry out many much needed repairs. Business is quiet in Cleveland iron, consumers not having settled down yet. There is a scarcity of foundry iron, but this is expected to improve and traffic conditions are better. A good inquiry is appearing from neutral countries, but at present it is impossible to deal with these, export licenses being withheld because all the iron being produced is still required for home and Allied consumption. The home price stands at 99s. for No. 1 and 95s. for No. 3 Cleveland. An excellent inquiry also exists for East Coast hematite the supplies of which are barely able to satisfy the demands. Consequently even for Allied countries only limited quantities are available. The maximum home price is 122s. 6d. and for export 172s. 6d. The demand for West Coast iron entirely absorbs the supply.

In steel the foremost question is still that of subsidies. Export business is practically impossible and buyers overseas, having definite contracts with works here, will obviously not pay what amounts to a fine of pounds a ton in consideration of shipping permits being issued. It is reported that some works have been told that if they will guarantee payment of the subsidy by the buyers they will be allowed to ship material against old contracts. This all makes business very difficult from the merchant point of view. The home demand for steel is good.

In the government announcement at the beginning of December relating to prices of iron and steel it was stated that the powers of the Ministry of Munitions would be used to prevent undue hoarding of subsidized material in anticipation of a subsequent rise in price, and that during the period of subsidy, distribution of cheap material would be made on an equitable basis. It is now announced by the authorities that after discussion with the industries the following arrangements have been made. As regards stocks of iron and steel held by makers or others it is considered reasonable that stocks should be restored to a normal level, and consequently it is proposed that such persons should be permitted without any claim by the government for repayment of subsidies to replenish their stocks to a total of not more than 100 tons above the amount held on Oct. 31, 1915 (being a date prior to the period of control), or Oct. 31, 1918, being a date approximating the conclusion

of hostilities, whichever amount may be the greater. Any excess beyond these quantities free of rebate will be liable to the Ministry of Munitions for a certain sum per ton to be announced shortly in respect of the subsidies on any such excess held as on April 30, 1918. In view of this an order will be issued shortly calling for returns of stocks. The order will further contain provisions for securing payment to the Ministry of Munitions of the sums above mentioned in respect of any excess stock held on April 30 of this year. The Ministry of Munitions are also endeavoring to secure equitable distribution and invite those who have complaints to make to seek the assistance of the area committee of their locality.

A new company has been registered with a capital of £1,000,000 called the Sheffield Steel Products, Ltd., to take over a number of concerns at Sheffield, including the following tool and cutlery firms: Carr, Wild & Co., Ltd.; Boswell, Hatfield & Co., Ltd.; E. W. Cheesman & Co.; Sheffield Steel Products, Arnold & Son, and the Chaucer Plating Co. Another item of interest is the formation of an electrical combine which has acquired the shares of the Coventry Ordnance Works and the Phoenix Dynamo Manufacturing Co., both private companies, and an offer is now being made to Dick Kerr & Co.'s shareholders to change their shares. The new company is called The English Electrical Co., Ltd., and has a registered capital of £5,000,000.

The great demobilization muddle is the main topic of conversation, and unless a little common sense is used, the country will be faced with trouble second only in gravity to the war itself. There are now 14 different departments nibbling at the chains. Forms by the million are floating about and instructions, without end, to say nothing of the protestations that "everything is being done." Public temper is warming both among employers and the men for whom jobs are waiting.

Birmingham

BIRMINGHAM, ALA., Feb. 3.

Pig Iron.—The Birmingham pig iron market is on a \$31 basis for iron 1.75 to 2.25 per cent silicon, with the three companies that are doing the selling admitting that basis and booking on it. There has not been entire agreement of sellers and it is understood that some pig iron is being stored where \$34 is asked. Two companies quoting \$31, after holding for three weeks to \$34, sold around 1000 tons each during the past week. The feature of the bookings was the entrance in the market of a number of sanitary pipe shops, which took on prompt iron preparatory to initial operations for the spring trade. The leading interest reports only a few sales of small-sized lots. Nothing further has been recently heard of export metal, but new ocean rates are expected to develop inquiry. There has been no increase in the make, but a Woodstock stack and possibly a furnace of the Tennessee company are expected to resume shortly. The coal output still lags and restricts furnace operations, although much coke heretofore going into operation of idle furnaces is easing the situation. At the close of last week the Ensley mills of the Tennessee company, the Fairfield mills of the American Steel & Wire Co., and the hoop and cotton tie mills of the Conners-Weyman interests were from 90 to 100 per cent in operation, while the Gulf States Steel Co. continued to report only 60 per cent operation and the piling up of some of its output. The last named company hopes that further recession in ocean rates will enable it to resume the very large and profitable foreign business which it enjoyed before the war. We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, 1.75 to 2.25 silicon.....	\$31.00
Bar.....	30.00

Cast Iron Pipe.—Sanitary shops begin to see orders coming in as the result of reduced prices and approach of spring building operations. The large water pipe interests have been sounded by some large consumers and there is prospect of one or two large orders being placed.

Old Material.—Local dealers have held back from local trading at the new low levels, but large local consumers contend that they have obtained and are offered more than they wish by outsiders. Local yards have been apparently unable to dispose of their stocks elsewhere on account of the low prices prevailing there, hence there are believed to have been some accumulations. We quote per gross ton f.o.b. Birmingham district yards, prices to consumers, as follows:

Old steel axles.....	\$28.00 to \$30.00
Old steel rails.....	15.00 to 16.00
Heavy melting steel.....	14.00 to 14.50
No. 1 railroad wrought.....	20.00 to 21.00
No. 1 cast.....	20.00 to 20.50
Carwheels.....	20.00 to 20.50
Tramcar wheels.....	19.50 to 20.00
Machine shop turnings.....	8.00 to 8.50
Cast iron borings.....	8.00 to 8.50
Stove plate.....	13.00 to 13.50

San Francisco

SAN FRANCISCO, Feb. 1.

The jobbers are now pretty well stocked up on all materials. They state that there is no likelihood of any material reduction in prices until their stocks are about disposed of. Without a strike the jobbers will probably be able to get rid of their stocks before material cuts are made in the Eastern market which would force a like reduction on the Coast.

Bars and Shapes.—Bars are easier under a good demand. There has not arisen much of a demand for structural at present prices.

Plates and Sheets.—There is little demand for either plates or sheets. The jobbers are of the opinion that as soon as consumers realize that there is no likelihood of an immediate reduction in the jobbing prices of plates that a much livelier business may be looked for. The shipyards are about the only buyers of plates at the present time, and the demand from that source is not large.

Cast-Iron Pipe.—A great deal of cast-iron pipe is needed for improvements and extensions and in a number of cases municipalities have voted the authority to purchase a large tonnage, but those in authority are holding off evidently in the expectation of lower prices.

Pig Iron.—Pig for immediate shipment has been offered in small quantities of a car or two at from \$1 to \$1.50 less than the market. It is believed that these lots are re-sale offers, as no new contracts are being offered below last month's prices. The users of pig seem to have enough reaching them on old contracts and no other pig is coming into this market.

Coke.—The supply of coke seems ample for all immediate needs. There is little inquiry and no coke has been bought in quantity below last year's prices. Some brokers have offered a little at a lower price, but there is not enough of this to affect the market.

Old Materials.—There is no standard of price on scrap in this market. The mills have forced the price down for their own consumption. They are now paying from \$20 to \$21 for the general run of scrap on the basis of the net ton of 2000 lb. The scrap dealers are not buying for re-sale, as the market is too uncertain, but all users of scrap seem to be getting all they need. There is a good demand for export but little is moving because of the lack of bottoms.

Cleveland

CLEVELAND, Feb. 4.

Iron Ore.—Henry Ford is in the market for iron ore for his new blast furnace plant in Detroit, one of the two stacks of which will be ready for operation shortly. Mr. Ford has submitted to some of the ore firms terms under which he would like to contract for his ore, but his proposals are of such a character that apparently they have not aroused much interest among ore sellers, who are not inclined to depart from the usual methods of marketing their ore. In response to inquiries as to ore prices, some consumers have been informed that the only prices now are the last Government prices and they maintain that if present wages

are maintained ore prices cannot be reduced. We quote delivered lower Lake ports as follows:

Old range Bessemer, \$6.65; old range non-Bessemer, \$5.90; Mesaba Bessemer, \$6.40; Mesaba non-Bessemer, \$5.75.

Pig Iron.—The market is almost lifeless. A few inquiries, mostly for small lots of foundry iron, have come out during the past week or two, but in nearly every case they have not resulted in sales. A large share of consumers, particularly of foundry iron, have heavily overbought because they placed orders on the basis of their war-time requirements and are now operating their foundries at greatly reduced capacity. As a result, considerable resale iron is now being offered, some of it already in foundry yards, and the remainder not yet shipped from furnaces. Also, some consumers are asking furnaces to cancel first-half contracts, but these requests are being met with refusals. Furnaces are trying to accommodate their trade by holding back on shipments and stocks in furnace yards are growing. A surplus exists in all grades except possibly malleable iron. With the falling off in the melt, only one merchant furnace, of which the product is sold by Cleveland interests, has blown out. This is a Buffalo furnace. Southern producers have generally agreed to revise their first-half of 1919 contracts to the \$31 basis, but are declining to make this reduction on the price of iron still unshipped on old contracts. Only about 30 per cent of the Southern iron called for in the contracts is now being shipped into this territory. We quote delivered Cleveland as follows:

Bessemer	\$33.60
Basic	30.40
Northern No. 2 foundry	31.40
Southern No. 2 foundry, silicon, 2.25 to 2.75	37.25
Gray forge	30.40
Ohio silvery, 8 per cent silicon	46.90
Standard low phosphorus, Valley furnace	51.00

Coke.—In spite of the weakness reported in the coke market in the Pittsburgh district, particularly in furnace coke, leading makers are quoting in this district standard Connellsville foundry coke at the old Government price of \$7 per net ton at oven. This price is for prompt shipment and for contracts for the entire year. A few car lot sales for prompt shipment are reported on this basis and some Virginia foundry coke has been sold at \$8.25, the old Government price. Some by-product coke contracts provided that when Government regulation was removed the price should be the prevailing market price, and other contracts provided that in case regulations were removed the last Government price would prevail.

Bolts, Nuts and Rivets.—The demand for bolts and nuts is very light and the trade does not look for much activity within the next 60 or 90 days. Makers have caught up on deliveries and are reducing plant operations. Regular discounts are maintained. Some rivet contracts are being taken for the first half at regular prices, and a Cleveland maker has just received specifications from a shipyard for 800 tons. Price shading of from 5 to 10 per cent on small rivets is general, but most makers so far are adhering to regular prices on large rivets.

Finished Iron and Steel.—The demand in finished lines shows a gradual improvement. Mills are getting a fair volume of miscellaneous inquiries and orders, the call being largely for steel bars. Some consumers are buying only for immediate needs, largely in car lots, and others are covering for their requirements for about three months. Automobile manufacturers are placing orders more freely and the demand continues good from the tractor and farm implement field. Some inquiry is coming out for both carbon and alloy steel that will be used in export products. Some resale bars are being offered by Government contractors at below regular prices. The demand for semi-finished steel is very light and Government billets in considerable tonnage are coming on the market. Consumers are now getting shipments of low-priced steel that have been on order books for a long time. The plate market is quiet, orders seldom being larger than car lots. A new inquiry has come out for 2000 tons of plates for Japan. The demand for sheets shows some improvement, but orders are not sufficient to keep mills running full.

There is a steady demand for fence and nails in car lots. Warehouse business has improved, this being partly due to the fact that jobbers now have much better stocks than they have had for the past year. Warehouse prices are as follows:

Steel bars, 3.87c.; plates, 4.17c.; structural material, 3.97c.; No. 10 blue annealed sheets, 5.07c.; No. 28 black sheets, 6.12c.; No. 28 galvanized sheets, 7.47c.

Old Material.—Prices continue to decline on practically all grades and nobody is predicting that the bottom has been reached. Several dealers are still buying what scrap they can pick up at around the prevailing prices, but there is very little demand from consumers. A Cleveland mill that bought a tonnage of heavy melting steel a week ago is now out of the market. It is understood that this purchase was made to mix the low priced material with the high priced scrap already on hand. For heavy melting steel \$16 appears to be the top of the market to-day. A sale of low phosphorus melting stock is reported at \$14.50, although this appears to be considerably lower than the prevailing price quotation on this grade. A Cleveland mill is offering \$15 for busheling and \$16 is being offered for high quality stove plate. Grate bars have sold at \$15. We quote delivered consumers' yards in Cleveland and vicinity as follows:

Heavy melting steel	\$15.00 to \$16.00
Steel rails, under 3 ft	21.00 to 22.00
Steel rails, rerolling	22.00 to 23.00
Iron rails	26.00 to 27.00
Iron car axles, nominal	37.00 to 38.00
Steel car axles	37.00 to 38.00
Low phosphorus melting scrap	17.00 to 18.00
Cast borings	9.50 to 10.50
Iron and steel turnings and drillings	7.75 to 8.25
Compressed steel	11.00 to 12.00
No. 1 railroad wrought	20.00 to 21.00
Cast iron carwheels	22.00 to 23.00
No. 1 railroad wrought	20.00 to 21.00
Agricultural malleable	16.00 to 17.00
Railroad malleable	17.00 to 18.00
Steel axle turnings	11.00 to 12.00
Light bundled sheet scrap	8.00 to 9.00
No. 1 cast	21.00 to 22.00
No. 1 busheling	15.00 to 15.50
Railroad grate bars	14.50 to 15.50
Stove plate	15.00 to 16.00

New York

NEW YORK, Feb. 4.

Pig Iron.—The increased interest in export business since the reduction in ocean freight rates continues, but it has developed that at present prices and freight rates for American irons there is very little prospect of any exporting being done, but it is hoped that with further reductions in freight rates considerable business will be done with foreign countries. A limited tonnage of Virginia iron is now obtainable at \$31, furnace, for No. 2X, or \$35.40, New York. But this is still 50c. below the delivered price of Buffalo iron, which can be had at \$34.90 and will be sold at about \$34.15 after the opening of canal navigation. In spite of the action of some Virginia furnaces in selling at lower prices, the leading Virginia company is very firm in its policy in declining to revise contracts for iron sold for delivery after Jan. 1. Alabama furnaces are also indisposed to revise contracts. We quote prices as follows for tide-water delivery for Northern and Southern grades:

No. 1 foundry, silicon, 2.75 to 3.25	\$37.90 to \$38.30
No. 2 X, silicon, 2.25 to 2.75	36.15 to 36.55
No. 2 plain, silicon, 1.75 to 2.25	34.90 to 35.30
No. 2 X, Virginia, silicon, 2.25 to 2.75	35.40 to 36.40
No. 1 Southern, silicon, 2.75 to 3.25	41.70
No. 2 Southern (all rail), silicon, 2.25 to 2.75	39.95
No. 2 Southern (all rail), silicon, 1.25 to 2.25	38.70

Ferroalloys.—Very little interest is yet shown in either ferromanganese or spiegeleisen. There have been sales of a few carload lots of domestic ferromanganese at about \$175 to \$200, delivered, but most of this has been resale material. The production in December was 23,907 gross tons, according to the blast-furnace reports of THE IRON AGE, which brings the total for 1918 to over 345,000, which is a new record. It is expected that the January output was considerably less than the December. The spiegeleisen market is regarded as weak. Quotations continue to be nominal at \$60 for the 16 to 18 per cent alloy and about \$65

for the 19 to 21 per cent material, both on a delivered basis. A firm offer would bring out lower prices. Last week there was an inquiry for several hundred tons, but this week the buyer withdrew the inquiry. The 50 per cent ferrosilicon market is extremely quiet and seems to be dominated by resale material which it is understood has been offered as low as \$110 per ton. There are several shell makers which appear to have an excess supply of this alloy and are willing to part with it. Ferrchrome is quoted at 32c. per lb. of contained chromium for the grade containing 4 to 6 per cent carbon, with 30c. per lb. asked for that having 6 to 8 per cent carbon, and 32c. per lb. for that having 8 to 10 per cent carbon. Ferrotungsten and ferrovanadium are not quoted. Ferro-carbon-titanium, 15 to 18 per cent, is selling at \$200 per net ton in carload lots, at \$200 per ton in lots between one ton and a carload, and at \$250 per ton in lots less than a ton, f.o.b. Suspension Bridge, N. Y.

Cast-Iron Pipe.—Recent reductions amounting to \$5 per ton have not stimulated business, which is at a very low point for this time of the year. Although some municipalities are badly in need of pipe, no business of importance is pending from them or from private buyers. Prices for 6-in. and heavier, are \$62.70, New York; for 4-in., \$65.70; for 3-in., \$72.70, and \$1 additional for class A and gas pipe.

Finished Material.—Exporters say there is a liberal inquiry for steel products, but very little business is being placed. Their explanation is that buyers abroad are waiting for lower prices and still lower ocean freight rates. It is the view of a number of the large export companies which specialize in iron and steel that American mills should make a sharp reduction in prices. They do not attempt to argue that a sharp cut would immediately bring out any considerable volume of business, but they think it would bring that much nearer the day when buyers will be willing to place orders with confidence that prices have reached bottom. An opinion which finds support in some quarters is that the level which prices will eventually reach is about 2c. per lb. for shapes and bars and 2.25c. for plates. It would not be surprising to some in the trade if steel manufacturers made a fairly substantial reduction within the very near future, accompanied in all likelihood by wage reductions. Japan is again in the market for plates, but is placing no large orders. One of 150 tons has been taken by a central Pennsylvania mill at 3c., Pittsburgh. There are fair inquiries in the market for rails, both heavy and light. Rail mills are in need of orders, but business at the prices asked is halting. Light rerolled rails have been quoted at 2.60c., Pittsburgh, on a domestic inquiry. The mill price on new light rails continues at 3c., Pittsburgh. The American Locomotive Co. is in the market for 1200 tons of plates, about half boiler and half tank quality, for 40 locomotives to be built at its Montreal, Que., works. Otherwise domestic inquiry is light. Jobbers are doing a good business. Many consumers who ordinarily figure with the mills are placing small orders for current requirements with warehouses. The American Locomotive Co. has received orders for a total of 62 locomotives from abroad. Forty of these are mountain type engines for the South African Railways. The railroad of the Province de Santa Fé of Argentina has contracted for 20 Pacific type locomotives and a railroad in Portuguese East Africa has ordered two 19-ton mogul engines. No new railroad car business of importance is being placed, but car builders expect release orders soon for about 20,000 cars, which were awarded some time ago by the Director of Military Railways for shipment to France. Negotiations are in progress for the sale of these cars to France, and if financial arrangements can be made it is believed that work will proceed soon on the entire number. The structural steel market is not active, but the newspapers report many building projects in New York, which have not as yet reached the point of getting bids on the fabricated steel. Based on offerings of common merchant bar iron by a few of the smaller mills at 2.90c., Pittsburgh, we quote 3.17c., New York, on this grade of iron. We quote mill shipments as follows: Steel bars, 2.97c.; shapes, 3.07c.; plates, 3.27c.; common bar iron, 3.17c.; all New York. Out-of-store

prices are as follows: Steel bars, 3.97c.; structural shapes, 4.07c.; plates, 4.27c.; No. 10 blue annealed sheets 5.17c.; one-pass cold-rolled black sheets, No. 28 gage, 6.22c.; No. 28 galvanized sheets, 7.57c.; hoops, 4.57c.; bands, 3/16 in., Nos. 10 and 12, 4.57c.; shafting, plus 9 per cent off list.

Old Material.—The ending of the strike in foundries in the Metropolitan district has aroused hope that the demand for cast scrap will be stimulated, but this has not yet taken place. Mills are not buying and there are very few transactions between dealers in any kind of scrap. Prices brokers are quoting per gross ton, New York, follow:

Heavy melting steel	\$11.00 to \$12.00
Rerolling rails	14.50 to 15.00
Relaying rails, nominal	50.00 to 55.00
Iron and steel car axles	22.00 to 24.00
No. 1 railroad wrought	19.00 to 20.00
Wrought-iron track	15.00 to 16.00
Forge fire	11.00 to 12.00
No. 1 yard wrought, long	16.00 to 17.00
Light iron	5.00 to 6.00
Cast borings (clean)	9.00 to 10.00
Machine shop turnings	7.00 to 8.00
Mixed borings and turnings	5.00 to 6.00
Iron and steel pipe (1 in. minimum diameter), not under 2 ft. long	12.00 to 13.00
Stove plate	15.00 to 16.00
Locomotive grate bars	15.50 to 16.50
Malleable cast (railroad)	15.00 to 16.00
Old carwheels	23.00 to 24.00
Prices which brokers are quoting to dealers in New York and Brooklyn, per gross ton, are:	
No. 1 machinery cast	\$21.00 to \$22.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	17.00 to 18.00
No. 1 heavy cast, not cupola size	15.00 to 16.00
No. 2 cast (radiators, cast boilers, etc.)	16.00 to 17.00

Cincinnati

CINCINNATI, Feb. 4—(By Wire).

Pig Iron.—The market is in the doldrums and no transactions of any kind are reported. Buyers are holding off and even those who are not covered entirely for their first half requirements are not willing to make any contracts. Occasional carload lots of special iron are disposed of, but even this business is lighter than it has been for some time past. No definite change in prices has yet been made by Southern furnaces, with the exception of the first two producers in that district, which made a reduction of \$3 from the base price several weeks ago. It is rumored that other furnaces now in operation and which are piling iron would consider firm offers below the last Government figure. As most Northern furnaces are quoting on a flat base price of \$31, furnace, for foundry iron based on 1.75 to 2.25 per cent silicon, the question of Southern competition in this market is impossible as long as Northern furnaces can supply the demand which they are now easily able to do. Jobbing foundries are running barely above 35 per cent capacity and most of them have a large stock of iron piled. The very low price made on scrap of all kinds induces melters to increase scrap in their mixtures as much as possible, and this naturally cuts down the consumption of pig iron to an appreciable extent. Ferroalloys are not in demand, but occasional small lots of high silicon iron are bought by melters in order to sweeten their mixtures.

Based on freight rates of \$3.60 from Birmingham and \$1.80 from Ironton, we quote, f.o.b. Cincinnati:	
Southern coke, No. 1 foundry and 1 soft	\$35.85
Southern coke, No. 2 foundry and 2 soft	34.60
Southern coke, No. 3 foundry	34.10
Southern No. 4 foundry	33.85
Southern gray forge	33.60
Ohio silvery, 8 per cent silicon	49.30
Southern Ohio coke, No. 1	34.05
Southern Ohio coke, No. 2	32.80
Southern Ohio coke, No. 3	32.30
Southern Ohio malleable Bessemer	33.30
Basic, Northern	31.80
Standard Southern carwheel	51.60

Finished Material.—The very prompt shipments now being made by the mills indicate that they have caught up with back orders, and there is evidence that they are reaching out after new business more strenuously than at any time since the armistice was signed. The jobbers as a rule do not care to accumulate any large stocks, and in some cases shipments have been held up

to avoid demurrage charges, as cars cannot always be unloaded as promptly as they are received. No changes in jobbers' quotations have been made recently. Orders for cold-rolled shafting are more numerous. One local warehouse reports the average increase in general business in January as being about 40 per cent ahead of December. The sheet mills report a fairly good demand that is somewhat scattered, but business from customers in the South shows considerable improvement. There is also a better call for railroad spikes, the base mill price of which is \$3.65 per keg base, Pittsburgh, in carload lots. The less than carload price is quoted at \$4.65. A little better call for wire nails is in evidence, and hardware dealers are also buying barbed wire, but in very small quantities. Rivets and machine and carriage bolts are very slow.

The following are local jobbers' prices: Steel bars and small structural shapes, 4.13c. base; large rounds and squares 2 in. and over, 4.23c. base; plates, 4.48c. base; No. 10 blue annealed sheets, 5.48c.; steel bands, 3/16 in. and lighter, 4.98c. base (using the new band list). Reinforcing concrete bars, 4.25 1/2c., and wire nails, \$4.15 to \$4.20 per keg base.

Coke.—Some small quantities of high sulphur coke have been sold in different districts for prompt shipment below the regular quotations on scattered grades. The cuts made to dispose of this fuel range from 25c. to \$1 a ton. There is practically no contracting for future shipment. Connellsburg 48-hr. coke of standard quality is quoted at \$6 per net ton at oven and 72-hr. at \$7. Wise County furnace is around \$7.25 and foundry \$8.25. New River operators are making a flat price of \$8 per ton on both furnace and foundry grades. The output of ovens in all districts has reached the point where requirements can be taken care of without delay.

High-Speed Steel.—Business is falling off considerably, and there is not as great a demand as was developed during the first week in January. Machine shop activities are somewhat curtailed, and this is given as a reason for the slowing down in business. Standard grades of high-speed steel remain at \$1.90 per lb., base.

Non-Ferrous Metal Scrap.—The bottom seems to have dropped out of the market on practically everything, and to-day's quotation on heavy copper is around 13c., and on crucible copper from 13.25c. to 13.50c. Lead is very heavy at 4 1/2c. a lb. There is no call for block tin pipe, and as a consequence no staple price can be made.

Old Material.—Prices are still on the downward grade, and as the demand for scrap from the steel mills is falling off considerably, dealers predict that further reductions are in sight. Foundry scrap is not being melted at anything like a normal rate, and while cancellation requests have practically exhausted themselves there are still some hold-up orders on scrap due that was bought some time ago. Heavy melting steel is especially weak, as there is now practically no demand for it from either the Pittsburgh or Cleveland districts. Steel turnings are also weak, and there is no demand for them from any consuming source. The following are buying prices f.o.b. cars Cincinnati and southern Ohio in carload lots:

Per Gross Ton

Bundled sheet	\$12.00 to \$13.00
Old iron rails	28.50 to 29.00
Relaying rails, 50 lb. and up	44.50 to 45.00
Rerolling steel rails	23.00 to 24.00
Heavy melting steel	15.00 to 15.50
Steel rails for melting	20.00 to 21.00
Old carwheels	18.00 to 19.00

Per Net Ton

No. 1 railroad wrought	\$15.50 to \$16.00
Cast borings	5.50 to 6.00
Steel turnings	5.50 to 6.00
Railroad cast	16.50 to 17.00
No. 1 machinery	17.50 to 18.00
Burnt scrap	12.00 to 13.00
Iron axles	30.00 to 31.00
Locomotive tires (smooth inside)	18.00 to 19.00
Pipes and flues	11.50 to 12.00
Malleable cast	13.50 to 14.00
Railroad tank and sheet	10.50 to 11.00

The Gits Brothers Mfg. Co., maker of oil cups, has moved to 1940 South Kilbourne Avenue, Chicago.

St. Louis

ST. LOUIS, Feb. 3.

Pig Iron.—Furnace representatives are still waiting for the consumers to enter the market, and as yet there has been no marked indication that melters want to commit themselves to any contracts of moment. The usual number of small sales for special purposes or of special analyses or off-analysis iron have been reported, but these are of no moment in establishing a market. The disposition still seems to be to mark time and use only what iron is on hand or is coming in under contract. Nothing of consequence in re-sale iron has appeared on the market as yet and consumers are taking contract deliveries, especially where the reduction of \$3 per ton is effective.

Old Material.—The scrap market is literally shot to pieces with no one willing to buy, the dealers unwilling to speculate and all concerned apparently convinced that the railroads have a large quantity of material which they will have to release and thus drive the market even lower. Altogether the situation is one in which everybody seems afraid to make a move, but rather inclined to await developments before taking any specific action. In consequence anything in the way of a real quotation is impossible. Undoubtedly there is more old material available than can be absorbed and the Government supplies of scrap are also looked upon as likely to come on the market and add to the difficulties of the present situation. Literally nothing is being done by dealers except to comply with requirements under existing contracts and consumers are not pressing them very hard for any deliveries. In some instances embargoes are in effect and everywhere the inspection is very rigid. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

	<i>Per Gross Ton</i>
Old iron rails	\$22.00 to \$23.00
Old steel rails, rerolling	16.00 to 17.00
Old steel rails, less than 3 ft.	15.00 to 16.00
Relaying rails, standard sections, subject to inspection	45.00 to 50.00
Old carwheels	22.00 to 22.50
No. 1 railroad heavy melting steel	14.50 to 15.00
Heavy shoveling steel	17.00 to 17.50
Ordinary shoveling steel	14.50 to 15.00
Frogs, switches and guards, cut apart	14.50 to 15.00
Ordinary bundled sheet scrap	11.00 to 11.50
Heavy axle and tire turnings	12.00 to 12.50

	<i>Per Net Ton</i>
Iron angle bars	\$22.00 to \$23.00
Steel angle bars	15.00 to 15.50
Iron car axles	29.00 to 29.50
Steel car axles	25.50 to 26.00
Wrought arch bars and transoms	24.00 to 24.50
No. 1 railroad wrought	15.00 to 15.50
No. 2 railroad wrought	14.00 to 14.50
Railroad springs	17.00 to 17.50
Steel couplers and knuckles	17.00 to 17.50
Locomotive ties, 42 in. and over, smooth inside	14.50 to 15.00
No. 1 dealers' forge	12.50 to 13.00
Cast iron borings	10.00 to 10.50
No. 1 busheling	13.50 to 14.00
No. 1 boilers cut to sheets and rings	10.50 to 11.00
No. 1 cast	16.50 to 17.00
Stove plate and light cast	10.00 to 10.50
Railroad malleable	14.00 to 14.50
Agricultural malleable	13.00 to 13.50
Pipes and flues	12.00 to 12.50
Heavy railroad sheet and tank	11.00 to 11.50
Railroad grate bars	13.50 to 14.00
Machine shop turnings	7.00 to 8.00
Country mixed	11.50 to 12.00
Uncut railroad mixed	12.00 to 12.50
Horseshoes	16.00 to 16.50

Coke.—Uncertainty as to conditions after Jan. 31 was the occasion of a very dull state of affairs in the coke market, emphasizing the natural condition due to the lack of need for making new contracts and the lack of need for coke itself. As in the pig iron market, a waiting attitude has been assumed pending more definite developments. The local by-products industry is delivering on old contracts and therefore is not in the market to sell except on domestic sizes, which are consumed locally.

Finished Iron and Steel.—Mill representatives report very little new business appearing as yet, although they

have noted an increasing interest which they ascribe to the approach of the spring building season. Structural material is regarded as likely to be best in demand as the architects are understood to have considerable work under way which is likely to eventuate in real contracts within the next few weeks. Movement out of warehouse continues quiet and for such stock we quote as follows: Soft steel bars, 4.04c.; iron bars, 4.04c.; structural material, 4.14c.; tank plates, 4.34c.; No. 8 sheets, 5.19c.; No. 10 blue annealed sheets, 5.24c.; No. 28 black sheets, cold rolled, one pass, 6.29c.; No. 28 galvanized sheets, black sheet gage, 7.64c.

Brier Hill Steel Co. Meeting

YOUNGSTOWN, OHIO, Feb. 3.—At the seventh annual meeting Jan. 28 of the Brier Hill Steel Co., stockholders learned with regret that John Stambaugh, treasurer, is contemplating resigning. No treasurer was elected at the meeting. Death of his brother, H. H. Stambaugh, recently, and increasing importance of his private business, prompted Mr. Stambaugh's decision. He will continue, however, as a director and member of the advisory board.

Reports for the year reflected restrictions imposed by the war. Gross sales were in excess of \$43,000,000, stated President W. A. Thomas, while shipments for the year were 467,925 tons. In outlining future of the company and the steel industry in general, President Thomas predicted a period of readjustment lasting from six months to a year, during which operations are likely to be more or less intermittent. After that he anticipated five or six years of very prosperous business. Since the armistice was signed the company has been operating more or less regularly, but this week its eight-mill sheet plant at Warren, the Western Reserve works, is idle, while largely reduced schedules are in effect at the Thomas and Empire sheet mill plants in Niles. Officers were re-elected as stated in THE IRON AGE last week.

Must Repay Subsidies

WASHINGTON, Feb. 4.—British iron and steel companies who accepted Government subsidies must repay them if they want to do business in excess of their pre-war business, under a ruling of the British Minister of Munitions, cabled to the Bureau of Foreign and Domestic Commerce by Consul General Skinner at London. The order provides:

"From Jan. 7 no purchase shall be made or delivery taken of iron or steel by any person holding stock exceeding by more than 100 tons the amount of stock held by him on Oct. 31, 1915, or Oct. 31, 1918, whichever shall be the greater amount, except under special permit, which will only be granted on condition of permit holder repaying minister of munitions certain subsidies in respect of all such stock held by such permit holder on April 30, 1919, which may be so in excess as above mentioned."

Trumbull Steel Co. Earnings

YOUNGSTOWN, OHIO, Feb. 5—(By Wire).—President Jonathan Warner's statement at the annual stockholders' meeting of the Trumbull Steel Co., to-day, in Warren, showed gross sales in 1918 in excess of \$27,000,000. A total of 220,519 tons of finished products was shipped. Assets, including plant and Government securities, are \$26,974,113.54. Surplus after dividends and taxes is \$6,532,924.78. Taxes this year are estimated at \$2,500,000. The company's wages bill last year was \$7,000,000 and its monthly payroll is now at the rate of \$900,000. The sum of \$6,000,000 was expended for improvements. The company has acquired iron ore reserves in the Lake Superior region of nearly 5,000,000 tons. Mr. Warner stated no blast furnace additions will be made until prices are lower.

The Truscon Steel Co., Youngstown, Ohio, will erect a new machine shop 80 by 400 ft., for which considerable machine tools will be needed.

IRON AND INDUSTRIAL STOCKS

Trading Quiet Despite Unrestricted Money Conditions—Steel Stocks Almost Stationary

NEW YORK, Feb. 4.

The removal of the money restrictions which have prevailed so long has caused hardly any change in the character of trading. The expansion in activity which accompanied this change in the rates at once died down and since then dealings have been limited in volume and insignificant in trend. United States Steel common has held closely around 90, and activity in the other steels has been insignificant. There has been but little change in the copper stocks. Speculation has been confined to the tobaccos and to specialties.

The range of prices in active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis-Chalm. com.	30 1/4 - 31 1/2	Gulf States Steel.	51 1/4 - 52
Allis-Chalm. pf.	82 1/2 - 84	Int. Har. com.	112 1/2 - 114
Am. Can. com.	45 1/2 - 47 1/2	Int. Har. pf.	117 1/2
Am. Car & F. c.	87 1/2 - 89 1/2	Lackaw. Steel.	64 1/2 - 66 1/2
Am. Car & F. pf.	115 - 117 1/2	U. S. Supr. Corp.	19 - 20 1/2
Am. Loco. com.	59 - 60 1/2	Midvale Steel	40 1/2 - 42
Am. Loco. pf.	102 1/2 - 102 3/4	Nat. Acme	30 1/2 - 31
Am. Radiator com.	290	Nat. En. & S. c.	47 1/2 - 48 1/2
Am. Ship com.	104	N. Y. Air Brake.	91 1/4 - 100 3/4
Am. Steel Fdries.	78 1/2 - 79 1/2	Nova Scotia Steel	46 - 47
Bald. Loco. com.	64 1/2 - 68 1/2	Pressed Steel com.	62 1/2 - 64
Bald. Loco. pf.	102	Pressed Steel pf.	101 1/2
Beth. Steel com.	58 1/2 - 59 1/2	Ry. Steel Spg. c.	71 1/4 - 72 1/2
Beth. Steel cl. B.	58 1/2 - 60 1/2	Republic com.	72 1/2 - 73 1/2
Cambria Steel	113 1/2	Republic pf.	101 1/4
Case (J. I.) pf.	93 1/2	Sloss com.	32 - 49
Central Fdrys. pf.	32	Superior Steel	32 - 34
Chic. Pneu. Tool	62	Transue-Williams	38 1/4 - 38 3/4
Colo. Fuel	35 - 36	U. S. Alloy Steel.	38 1/4 - 38 3/4
Crucible Steel c.	52 1/4 - 55	U. S. Pipe pf.	45
Deere & Co. pf.	96	U. S. Steel com.	88 1/4 - 91
Gen. Electric	144 1/4 - 149	U. S. Steel pf.	113 1/4 - 115 1/4
Gt. No. Ore Cert.	36 1/2 - 38 1/2	Westingh. Elec.	40 1/2 - 41 1/2

Dividends

The Canadian Foundries & Forgings, Ltd., quarterly, 3 per cent on the common and 1 1/4 per cent on the preferred, payable Feb. 15.

The Eastern Steel Co., quarterly, 2 1/2 per cent on the common, payable April 15, and 1 1/4 per cent on the first and second preferred, payable March 15.

The Inland Steel Co., quarterly, 2 per cent, payable March 1.

The International Harvester Co., quarterly, 1 1/4 per cent on the preferred, payable March 1.

The Penn Seaboard Steel Corporation, quarterly, \$1.50, payable Feb. 1.

The Savage Arms Corporation, quarterly, 1 1/2 per cent on the common, 1 1/4 per cent on the first preferred and 1 1/2 per cent on the second preferred, payable March 15.

The Standard Parts Co., quarterly, 1 1/2 per cent, payable Feb. 15.

The Standard Sanitary Mfg. Co., quarterly, 1 1/2 per cent on the common and 1 1/4 per cent on the preferred, payable Feb. 10.

Youngstown Sheet & Tube Co. Assets

The annual meeting of stockholders of the Youngstown Sheet & Tube Co. will be held at Youngstown, Ohio, on Wednesday, Feb. 12. It is expected that the report of operations and profits made by this company during 1918 will be the best, by far, in its history. An unofficial report is that the Youngstown Sheet & Tube Co. has total net assets, as of Jan. 1, 1919, of \$105,000,000, and that the company has an aggregate of surplus and undivided profits at this time of about \$60,000,000. The company has no funded debt and was organized on Nov. 21, 1900, with a capital of \$600,000.

N. O. Nelson, Philanthropist, Fails

N. O. Nelson, founder and until recently president of the N. O. Nelson Mfg. Co., St. Louis, maker of plumbers' supplies, has filed a personal petition in bankruptcy in the United States District Court at New Orleans. He listed his liabilities at \$413,447.13 and his assets at \$400,596.18.

The petition follows closely upon the petition in bankruptcy filed in the same court by the Nelson Co-operative Co., a chain grocery store system founded by Mr. Nelson to aid the poor of New Orleans. Mr. Nelson's personal bankruptcy is attributed to his extensive philanthropic work.

Pittsburgh and Nearby Districts

The Jones & Laughlin Steel Co., Pittsburgh, has received permission from the Government to construct a stone wall nearly four miles long along the north side bank of the Monongahela River. This company recently bought a large amount of property in the Soho district, where its Soho blast furnace and open-hearth furnace and finishing mills are located, and it is building a large number of coke ovens near this site. This retaining wall is to prevent slips of its property on which these ovens will be located, and probably on which extensions to present plants will be made in the future.

A new office to procure work for returning soldiers and sailors has been opened recently in Pittsburgh by the United States Employment Bureau. Although the bureau has several employment agencies in that city the one established will be used especially for returned soldiers and sailors.

Stockholders of the Braddock Mfg. Co., steel founder and machinist, Braddock, Pa., at the annual meeting held in Braddock on Jan. 15, elected directors as follows: W. E. Troutman, R. W. Tener, F. C. Sullivan, H. L. Campbell and F. B. McConnell. The directors organized by electing officers as follows: W. E. Troutman, president; R. W. Tener, treasurer; F. C. Sullivan, vice-president; H. L. Campbell, secretary; F. B. McConnell, manager.

The stockholders of the Columbiana Foundry Co., Columbiana, Ohio, manufacturer of gray iron and semi-steel castings, at their annual meeting held recently, elected directors as follows: F. C. Sullivan, F. B. McConnell, J. W. Blackburn, C. Fuhrman and F. O. Funk. The first two reside at Pittsburgh, and the others in Ohio.

At a meeting of the Engineer's Society of Western Pennsylvania, held recently in its rooms in the Union Arcade, Pittsburgh, it was decided to erect a monument or memorial of some kind to the late George Westinghouse, at his home, known as "Solitude," at Homewood, near Pittsburgh. The property embraced in this home was recently transferred to the city of Pittsburgh for park purposes.

An election of officers for this year of the Engineer's Society of Western Pennsylvania was then held and George H. Neilson was elected president; George H. Danforth, vice-president; A. Stucki, treasurer, and K. F. Treschow, secretary. W. B. Spillmire and F. C. Schatz were elected directors.

The annual convention of the executive committee of the National Association of Electrical Contractors and Dealers of the United States was in session for two days in the William Penn Hotel, Pittsburgh, last week. Officers for the ensuing year were elected as follows: National chairman, William Creighton Peet, New York; national treasurer, B. H. Bendheim, Chicago; general manager and secretary, W. H. Morton, New York.

The plant of the Leetsdale Foundry & Mfg. Co., at Leetsdale, Pa., about 15 miles from Pittsburgh, is to be offered at receiver's sale on Jan. 31. The Potter Title & Trust Co., Pittsburgh, is receiver.

The Merchant Calculating Machine Co., San Francisco, has moved its Eastern sales office from Philadelphia to 237 Railway Exchange Building, Chicago.

The Norbom Engineering Co. is now located in its plant at Fifth and Ellis avenues, Darby, Pa.

The Andrews Engineering Co., Pittsburgh, has been chartered by the State of Pennsylvania, and has taken over and succeeded to all the business contracts and assets of the Andrews Construction Co. The unfinished contracts, operations and business of the Andrews Construction Co. will be carried on by the Andrews Engineering Co., after Jan. 1, 1919. The personnel of the Andrews Engineering Co. remains the same as of the Andrews Construction Co.

The McClintic-Marshall Corporation, Pittsburgh, has been granted a charter with a capital of \$5,000. This company has been organized to take care of and will handle the export business of the McClintic-Mar-

shall Co., steel fabricator, Pittsburgh, and also the Ritter-Conley Co., with works at Leetsdale, Pa., builder of heavy plate construction, and which is owned by the McClintic-Marshall Co.

In the United States District Court at Pittsburgh last week, there was confirmed three private sales of coal property and mining rights from the estate of J. V. Thompson of Uniontown, Pa. The first sale was consummated Jan. 7, this year, and covers 2282 acres of coal land for which James E. Dorsay paid \$1,480,098. On the same date 1177 acres were sold to H. G. Rockwell for \$450,636. The third sale covers several interests of Thompson in Green and Fayette counties to several persons, the value of which was \$65,369.44.

The Pittsburgh office of the Milwaukee Electric Crane & Mfg. Co. has been removed from 704 Empire Building to Room 2201 Farmers Bank Building, in that city.

The Braeburn Steel Co., Braeburn, Pa., is making some large additions to its plant, and has already erected one new steel building, and made an extension of 125 ft. to an old building. The company is figuring on further extensions and the addition of some new equipment, definite plans for which have not yet been made.

The monthly meeting of the Pittsburgh Foundrymen's Association was held in the rooms of the Americus Club in that city on Monday evening, Jan. 20. George F. Fisher, Whiting Foundry Equipment Co., Harvey, Ill., read a paper on "Converter Practice," illustrated with stereopticon views, showing a two-ton converter he installed for the Central Railways of Rio Janeiro, Brazil.

Stockholders of the American Spiral Spring & Mfg. Co., Pittsburgh, have elected directors as follows: J. B. Thomas, John Pfeil, Harry Wilson, R. R. Kitchen and R. E. L. Bailey.

Starting Monday, Jan. 20, motor truck trips for the carrying of merchandise of all kinds between Pittsburgh and Youngstown, both ways, were inaugurated. Daily trips are to be made by these trucks, stopping at all important points. It is believed the inauguration of this motor truck service between these two important points will be of great advantage to manufacturers and merchants as well in both places, and also to those located at intervening places. The service will be very much quicker than that afforded by the railroads, and deliveries of material from Pittsburgh will be made in Youngstown in only a few hours and vice versa.

Metallurgists Organize

Last week at Pittsburgh, steps were taken to organize what will be known as the National Metallurgist Society of America. Only active metallurgists, or men with past experience, are eligible to become members of the new organization. D. L. Mathias, connected with Mackintosh-Hemphill Co., Pittsburgh, presided at the meeting, and D. H. Paul was temporary secretary. A constitution and by-laws were adopted, and nominations for officers were made, and will be balloted on by letter. No date was set for the next meeting, which will be held in a month or six weeks. It is proposed to hold monthly meetings, at which papers relating to metallurgy will be read and discussed. After the Pittsburgh chapter is organized other chapters will be formed.

Effective Feb. 1, the Pennsylvania Railroad has discontinued piece work operation at its Altoona, Pa., shops, substituting a day wage system. All departments will make the change; a rate of 68c. per hr. will be paid in the future to machinists, molders, boilermakers, sheet metal workers and blacksmiths. Carmen will receive 58c. per hr. The changed schedule of work was recently voted by the men.

The Hoyt-Noe Steel Co., 817 West Washington Boulevard, Chicago, has changed its name to the General Steel Co. There is no change in personnel or management.

Addy Company Sixty Years Old

The Matthew Addy Co., engaged in the marketing of pig iron, coke, coal and alloys, celebrated its sixtieth anniversary Jan. 29, and to commemorate the event gave a dinner at the Queen City Club, Cincinnati. James A. Green, president of the company, presided and in a graceful speech recounted the conditions of the country and of the industry at the time Mr. Addy made his venture. James Bowron, president Gulf States Steel Co., was the central figure among the guests and made a happy speech of reminiscence and prophecy. C. H. Domhoff, Domhoff, Joyce & Co., once associated with Mr. Addy, told of the earlier facts of Mr. Addy's career, and addresses were also made by John A. Penton, secretary American Pig Iron Association and publisher of the *Iron Trade Review*, and by W. W. Macon, managing editor THE IRON AGE.

Mr. Green, in reviewing the business history of his company, told how Mr. Addy, who died in 1896, had requested his associates to carry on the business in his name, and provided adequate capital for that purpose, which capital was within a reasonably short time repaid in full to the estate. In regard to the future of the iron business, as well as the future of business in the United States, Mr. Green owned to a strong belief



JAMES ALBERT GREEN

that it is on a sound basis financially, and that the lessons of co-operation taught by the war will be of immense value.

Mr. Bowron, who has already passed through 60 years of business activity, having begun in November, 1858, pictured to his audience in a vivid way the contacts he had had with personalities and events of importance in the development of the industry in the lifetime of the Addy company. With pleasantries which partook of satire, his speech, delivered with the vigor and freshness of a man twenty years his junior, will long be remembered. Making iron in Alabama, he pointed out, had been no sinecure and intimated that "on us as a foundation with 2½ per cent for selling and sometimes 2½ per cent for guaranteeing" concerns like the Addy company had prospered. "Cincinnati men kept healthy; they were not subject to drafts," he said. And he could own to knowledge of a sale of 5000 tons of No. 2 iron at the "pleasant" price of \$6.25, with a commission which was to be deducted from this, and of a whole cargo of No. 4 iron at \$5.75 a ton.

The officers of the company besides Mr. Green are B. N. Ford, A. Burt Champion, R. M. Lambert and W. W. Hearne. The assemblage included iron masters, financiers and foundrymen.



MATTHEW ADDY

Iron Famine in Norway

WASHINGTON, Feb. 4.—Despite large resources of ore, Norway has an iron famine, says a special report to the Department of Commerce from Erwin Thompson, commercial attaché at Copenhagen.

"In the extreme northern part of Norway," says Mr. Thompson, "are large fields of iron ore yielding much more than the amount of iron necessary for the whole country. The present lack of coal, however, prevents the utilization of this ore for the country's needs, and there is an iron famine in the country. At the same time there are large water powers in the country which could be developed for the smelting of iron. Electric smelting, however, is a comparatively recent idea, and as electric and hydraulic machinery are about as scarce as coal, not much has been done in this line.

"A plan is now on foot for the utilization of 2500 hp. electricity for smelting ores of the Braastad Mines, where the ores are especially rich and well adapted for this process.

"There is a continual search in all Scandinavian countries for sources of fuel which previously had not been considered profitable to exploit. Many new peat fields have been discovered and old ones reopened. The latest find reported in Norway is on the island of Snølen in the Romsdalsfjord, where it is estimated that 8,000,000 tons would be found. Arrangements are being made there for mining 100,000 tons of peat per year."

The Heltzel Steel Form & Iron Co., Warren, Ohio, recently increased its capital from \$50,000 to \$100,000. The company manufactures a complete line of steel forms for concrete construction, as well as fabricates sheet steel and plate, and recently acquired by purchase the plant of the Newton Falls Construction Co., at Newton Falls, Ohio, which will be known as its Newton Falls plant. New machinery has been purchased, which considerably increases the manufacturing capacity, especially on steel forms for road, pavement and highway construction; finishing machines and strike-off templates for concrete roads, and a line of car unloaders.

Algoma Steel Operations

Working at 100 per cent capacity is the report of the Algoma Steel Corporation, Ltd., Sault Ste. Marie, Can., which has not been affected by the continent-wide cancellation of war contracts, as its main contracts pertain to the manufacture of rails and ship steel, which are peace-time products. It is stated by an officer of the company that most of the finished material will be consumed at home, particularly the rails, which will be used for the upkeep and extension of Canadian railroads. The lowering of ocean freight rates has made inquiry for export products brisk, particularly for a general line of steel materials for Japan and China. South America and the Far East will take the bulk of the exports, according to an official of the company. Sheets and nails, especially, are moving rapidly now. It is not expected that prices will drop before the middle of the year, by which time it is believed that wages will have fallen. The capacity of the plant in finished and semi-finished open hearth steel products is approximately 40,000 tons per month. Announcement is made of the appointment of the Spartan Products Co., Inc., Equitable Building, New York, as the corporation's general export agents.

The National Sales Engineering Corporation has been organized to handle the distribution of certain tools in the Detroit territory, having been given the exclusive sales representation for the Kelly Reamer Co., manufacturer of adjustable reamers and boring bars; the Buhr Buiwitt Co., distributor of Buhr-Buiwitt air equipment and other products. The officers of the corporation are E. E. Minard, president and general manager; C. H. Eckhard, vice-president; and T. J. Fraser, secretary and treasurer.

Edgar E. Durant, New Haven, Conn., has purchased the entire property of the G. F. Warner Mfg. Co. of that city, and will continue to manufacture gray iron castings under the name of the G. F. Warner Manufacturing Works.

Metal Markets

The Week's Prices

		Cents Per Pound for Early Delivery					
		Copper, New York		Lead		Spelter	
		Electro- lytic	New York	New York	St. Louis	New York	St. Louis
Jan.	Lake						
29	20.00	19.50	•71.50	5.25	4.95	7.05	6.70
30	20.00	19.25	•71.50	5.12 1/2	4.82 1/2	6.95	6.60
31	20.00	19.25	•71.50	5.12 1/2	4.82 1/2	6.85	6.50
Feb.							
1	19.50	19.00	•	5.05	4.75	6.85	6.50
3	19.50	18.75	•72.00	5.05	4.75	6.75	6.40
4	19.50	18.75	•72.00	5.05	4.75	6.70	6.35

*Nominal.

NEW YORK, Feb. 4.

The markets are all lifeless and devoid of interest. Copper continues to decline gradually on small sales. The tin market is dead. Lead has declined again. The spelter market is weak and business light. Antimony is inactive and unchanged.

New York

Copper.—There has been a fair amount of inquiry the past week and some business has been done on a declining market. Electrolytic copper has sold in small quantities, compared with normal demand, as low as 18.75c., New York, which we quote as the market for February delivery. Demand for Lake copper is small and is quoted as nominal at about 19.50c., New York.

Copper Averages.—The average price of Lake copper in January, based on daily quotations in THE IRON AGE, was 20.48c. per lb. The electrolytic average was 20.40c.

Tin.—The tin market is now the only one in which there are any restrictions, import or otherwise. It is still impossible for buyers to purchase for shipment from the Far East, although they could obtain the metal under such conditions at about 52c. to 54c. per lb. There is some talk of such purchases being made with the shipments consigned to England and held there until import restrictions into the United States are lifted. It is understood that only about one-third of the tin allocated to the United States Steel Products Co., and held at 72.50c. per lb., has been absorbed by American consumers. In the meantime the market continues dull and stale. American tin is obtainable at about 68c. to 69c., New York. The spot market is nominal at 72c., New York. Tin arrivals in January were only 1900 tons, of which 1850 tons came through Pacific ports. Stocks on Feb. 1 were 311 tons.

Lead.—The market is quiet and dull. On Friday, Jan. 31, the American Smelting & Refining Co. again reduced its price from 5.50c. to 5.25c., New York, or 4.95c., St. Louis. This has been met and cut by independent interests until to-day the metal is selling at 5.05c., New York, or 4.75c., St. Louis. Some business was done at 5c., New York, but it was of a special nature. Sellers freely quote 5.05c., New York, but there are few buyers. The present price level is regarded as attractive and buyers are gradually showing more interest with a good demand regarded as possible, even though the market may go lower. The demands of the ultimate consumer are slow in developing, but the turn of the market may come any day.

Spelter.—Prime Western for early or February delivery has continued to decline until it is quoted to-day at 6.35c., St. Louis, or 6.70c., New York, by some producers or dealers. Business is extremely light and some producers have reached the point where shutting down is seriously considered. The weekly Government report for the week ended Jan. 18 shows an increase in stocks of all grades of zinc of 2889 tons and a decrease in production of 153 tons. No more reports of stocks are to be issued because certain companies refuse to make a return of their stocks.

Antimony.—The market is very quiet and prices are slightly lower, with wholesale lots for early delivery quoted at 7.32 1/2c., New York, duty paid.

Aluminum.—The Government maximum prices of 33c. per lb. for 50-ton lots, 33.10c. per lb. for 15 to 50-ton lots and 33.20c. per lb. for 1 to 15-ton lots for virgin metal and for scrap are regarded as nominal, as the metal is obtainable under these levels, which are effective until March 1.

Old Metals.—Business is quiet, consumers purchasing only for immediate requirements. Dealers' selling prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	18.50
Copper, heavy and wire	18.00
Copper, light and bottoms	15.00
Brass, heavy	12.50
Brass, light	10.00
Heavy machine composition	18.00
No. 1 yellow rod brass turnings	10.00
No. 1 red brass or composition turnings	1.00
Lead, heavy	4.50
Lead, tea	3.25
Zinc	3.25

St. Louis

FEB. 4.—Non-ferrous metals have been quiet and dull the past week with the close on carloads as follows: Lead, 5c.; spelter, 6.72 1/2c., sellers' asking prices, and 6.60c. for February. In less than carloads quotations are: Lead, 5.50c.; spelter, 7.75c.; tin, 72 1/2c.; copper, 20c.; Asiatic antimony, 8.50c. In the Joplin district ore has been weaker, with the range down to \$40 per ton and lower on second grades of zinc blende, basis 60 per cent metal, with top grades hovering about \$50 and little buying. Calamine has been dull, with the price range, basis 40 per cent metal, \$30 to \$35 per ton. Lead has been dull at \$60 per ton, basis 80 per cent metal, and very little business. On miscellaneous scrap metals we quote dealers' prices as follows: Light brass, 8c.; heavy yellow brass, 11c.; heavy red brass, 16c.; light copper, 14.50c.; heavy copper and copper wire, 16c.; pewter, 40c.; tinfoil, 45c.; lead, 5c.; zinc, 4c.; tea lead, 4c.; aluminum, 20c.

Chicago

Feb. 4.—The metals share the general dullness. Copper quotations are nominal, transactions being few and at negotiated figures. Considerable tin has been bought at the Government price, but the market is now quiet. Not enough lead has moved to justify calling the market active. Spelter is lifeless. In antimony there has been a little trading. We quote copper at 22c. to 23c. for carloads; tin, 72.50c.; lead, 5.05c.; spelter, 6.60c.; antimony, 8.50c. to 9c. On old metals we quote copper wire, crucible shapes, 15c.; copper clips, 14.50c.; copper bottoms, 12.50c.; red brass, 14.50c.; yellow brass, 9.50c.; lead pipe, 3.75c.; zinc, 4c.; pewter, No. 1, 30c.; tinfoil, 35c.; and block tin, 45c.

Greenville Steel Car Co. to Build

PITTSBURGH, Feb. 5.—(By wire). The Greenville Steel Car Co., Greenville, Pa., has purchased 50 acres near its plant and contemplates the erection of a new steel car plant on the property, but definite plans have not been made. This company fabricates structural steel and has just opened an office at 51 East Forty-second Street, New York.

The new plant of the Weatherly Steel Castings Co., at Sharon, Pa., for the manufacture of converter steel castings, will be ready for operation about Feb. 15. The company has placed practically all of its machinery and has already purchased the remainder. It will be able to handle steel castings from 1 lb. to 5000 lb., and will have a capacity of 250 tons per month. C. H. Bleim is general manager.

The Ohio Metal Briquetting Co., Cleveland, has placed a contract with the Crowell-Lundoff-Little Co. for a new plant for manufacturing briquettes of scrap metal. Annealing furnaces and some other equipment will be required.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, with revisions effective Nov. 1, 1918, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 24.5c.; Boston, 30c.; Buffalo, 17c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49.5c.; Denver, 99c.; Omaha, 59c.; minimum carload, 30,000 lb. to four last named points; New Orleans, 58.5c.; Birmingham, 57.5c.; Pacific Coast, \$1.25; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is \$1.315, minimum carload 40,000 lb.; and \$1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c., minimum carload 46,000 lb.; Denver, 99c., minimum carload 40,000 lb. A 3 per cent transportation tax applies. On iron and steel items not noted above, rates vary somewhat and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, $\frac{1}{4}$ in. thick and over, and zees, structural sizes, 2.80c.

Wire Products

Wire nails, \$3.50 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails taking an advance over this price of \$2, and shorter than 1 in., \$2.50. Bright basic wire, \$3.35 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$3.25; galvanized wire, \$3.95; galvanized barb wire and fence staples, \$4.35; painted barbed wire, \$3.65; polished fence staples, \$3.65; cement-coated nails, \$3.40 base; these prices being subject to the usual advances for the smaller trade all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 58 per cent off list for carload lots, 57 per cent for 1000-rod lots, and 56 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....\$4.40 base
Large boiler rivets.....\$4.50
16-ga. x 6 in. smaller and shorter rivets.....50-10 per cent off list
Machine bolts h.p. nuts, $\frac{3}{8}$ in. x 4 in.:
Smaller and shorter, rolled threads.....50-10-5 per cent off list
Cut threads.....50-5 per cent off list
Larger and longer sizes.....40-10 per cent off list
Machine bolts, c.p.c. and t. nuts, $\frac{3}{8}$ in. x 4 in.:
Smaller and shorter.....40-10 per cent off list
Larger and longer.....35-5 per cent off list
Carriage bolts, $\frac{3}{8}$ in. x 6 in.:
Smaller and shorter, rolled threads.....50-5 per cent off list
Cut threads.....40-10-5 per cent off list
Larger and longer sizes.....40 per cent off list
Lug bolts.....50-10 per cent off list
Flow bolts, Nos. 1, 2, 3.....50 per cent off list
Hot pressed nuts, sq. blank.....2.50c. per lb. off list
Hot pressed nuts, hex. blank.....2.30c. per lb. off list
Hot pressed nuts, sq. tapped.....2.30c. per lb. off list
Hot pressed nuts, hex. tapped.....2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank.....2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped.....2.00c. per lb. off list
Semifinished hex. nuts:
20-20 and larger.....60-10-10 per cent off list
9-16 in. and smaller.....70-5 per cent off list
Stove bolts.....70-10 per cent off list
Stove bolts.....2 $\frac{1}{2}$ per cent extra for bulk
Tire bolts.....50-10-5 per cent off list

The above discounts are from present lists now in effect.
All prices carry standard extras.

Wire Rods

Common basic or Bessemer rods to domestic consumers, \$17; chain rods, \$65; screw, rivet and bolt rods and other rods of that character, \$65. Prices on high carbon rods are irregular. They range from \$70 to \$80, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. x 4 $\frac{1}{2}$ in. and heavier, per 100 lb., \$5.70, in lots of 200 kegs of 200 lb. each, or more; track bolts, \$1.90. Boat spikes, \$5.05 per 100 lb. f.o.b. Pittsburgh.

Terne Plate

Prices of terne plate are as follows: 8-lb. coating, 200 lb., \$1.10 per package; 8-lb. coating, I. C., \$14.80; 12-lb. coating, I. C., \$16.50; 15-lb. coating, I. C., \$17.50; 20-lb. coating, I. C., \$19.50; 27-lb. coating, I. C., \$20.00; 30-lb. coating, I. C., \$21.00; 35-lb. coating, I. C., \$22.00; 40-lb. coating, I. C., \$22.00 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.70c. from mill. Relined iron bars, 5.00c.; common iron bars, 3.50c. in carload and larger lots, f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card.

Steel Inches	Butt Weld		Iron Inches	Iron Inches		Galv. List	
	Black	Galv.		Black	Galv.		
$\frac{1}{8}$, $\frac{1}{4}$ and $\frac{3}{8}$...	47	20 $\frac{1}{2}$	$\frac{1}{8}$ and $\frac{3}{8}$...	26	+1		
$\frac{1}{2}$...	51	36 $\frac{1}{2}$	$\frac{1}{2}$...	27			
$\frac{3}{4}$ to 3...	54	40 $\frac{1}{2}$	$\frac{3}{4}$ to 1 $\frac{1}{2}$...	31	13		
15...	35	...	7 to 12...	36	20		
Lap Weld		Lap Weld		Lap Weld		Lap Weld	
$\frac{1}{2}$ to 6...	47	34 $\frac{1}{2}$	$\frac{1}{4}$...	21	6		
$\frac{1}{2}$ to 12...	47	33 $\frac{1}{2}$	2...	28	14		
13 and 14...	37 $\frac{1}{2}$	...	2 $\frac{1}{2}$ to 6...	31	18		
15...	35	...	7 to 12...	28	15		
Butt Weld, extra strong, plain ends		Butt Weld, extra strong, plain ends		Butt Weld, extra strong, plain ends		Butt Weld, extra strong, plain ends	
$\frac{1}{8}$, $\frac{1}{4}$ and $\frac{3}{8}$...	43	25 $\frac{1}{2}$	$\frac{1}{8}$, $\frac{1}{4}$ and $\frac{3}{8}$...	25	8		
$\frac{1}{2}$...	48	35 $\frac{1}{2}$	$\frac{1}{2}$...	30	17		
$\frac{3}{4}$ to 1 $\frac{1}{2}$...	52	39 $\frac{1}{2}$	$\frac{3}{4}$ to 1 $\frac{1}{2}$...	36	21		
2 to 3...	53	40 $\frac{1}{2}$	7 to 12...	18	6		

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh:

Lap Welded Steel	Charcoal Iron
3 $\frac{1}{2}$ to 4 $\frac{1}{2}$ in...	37
2 $\frac{1}{2}$ to 3 $\frac{1}{4}$ in...	27
2 $\frac{1}{4}$ in...	20 $\frac{1}{2}$
1 $\frac{3}{4}$ to 2 in...	16
3 $\frac{1}{2}$ to 4 $\frac{1}{2}$ in...	12 $\frac{1}{2}$
3 to 3 $\frac{1}{4}$ in...	+2
2 $\frac{1}{2}$ to 2 $\frac{3}{4}$ in...	+4 $\frac{1}{2}$
2 to 2 $\frac{1}{4}$ in...	+19 $\frac{1}{2}$
1 $\frac{3}{4}$ to 1 $\frac{7}{8}$ in...	+32

Standard Commercial Seamless—Cold Drawn or Hot Rolled	Per Net Ton	Per Net Ton	
1 in...	\$334	1 $\frac{3}{4}$ in...	\$214
1 $\frac{1}{4}$ in...	274	2 to 2 $\frac{1}{2}$ in...	184
1 $\frac{3}{4}$ in...	264	2 $\frac{1}{4}$ to 3 $\frac{1}{4}$ in...	174
1 $\frac{1}{2}$ in...	214	4 in...	194
		4 $\frac{1}{2}$ to 5 in...	214

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots are as follows:

Blue Annealed—Bessemer	Cents per lb.
No. 8 and heavier...	3.85
Nos. 9 and 10 (base)...	3.90
Nos. 11 and 12...	3.95
Nos. 13 and 14...	4.00
Nos. 15 and 16...	4.10

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21...	4.50
Nos. 22 and 24...	4.55
Nos. 25 and 26...	4.60
No. 27...	4.65
No. 28 (base)...	4.70
No. 29...	4.80
No. 30...	4.90

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11...	5.05
Nos. 12 and 14...	5.15
Nos. 15 and 16...	5.30
Nos. 17 to 21...	5.45
Nos. 22 and 24...	5.60
Nos. 25 and 26...	5.75
No. 27...	5.90
No. 28 (base)...	6.05
No. 29...	6.30
No. 30...	6.55

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16...	4.50
Nos. 17 to 21...	4.55
Nos. 22 and 24...	4.60
Nos. 25 and 27...	4.65
No. 28 (base)...	4.70
No. 29...	4.75
No. 30...	4.75
Nos. 30 $\frac{1}{2}$ and 31...	4.80

PERSONAL

After making a brilliant record as a soldier in France, Major Paul Debevoise has resumed his active connection with the Debevoise-Anderson Co., seller of



PAUL DEBEVOISE

pig iron and coke, New York. He entered the Officers' Training Camp at Fort Meyer, Va., in May, 1917, and left it as a captain in August. After being stationed for a time with the 318th Regiment, 80th Division, at Camp Lee, Va., he was transferred to Camp Dix in command of Company A, 312th Regiment, 78th Division. In December, he was promoted to major as commander of the First Battalion. In May, 1918, he sailed for France and after his command had been brigaded for a time with the British and was about to start for Arras, he was ordered to the

American sector and saw service of the fiercest kind, first in the St. Mihiel sector, where he did his full share in the magnificent work of cleaning up the boche and later in the never-to-be-forgotten terrific fighting in the Argonne forest. Major Debevoise made such a record for bravery and efficiency that he was selected to train a new division and was recommended for promotion to the rank of lieutenant-colonel. He was ordered to return to the United States and arrived home Nov. 15, but as the armistice was signed Nov. 11 he did not receive his promotion, and was mustered out of service. The casualty list of the regiment included 60 per cent of its membership.

Major Debevoise has given much thought to the subject of employment of soldiers and in a recent address before the Newark Foundrymen's Association, expressed the opinion that manufacturers and other employers should give employment to soldiers as quickly as possible after their return to this country, but that the men should be paid for a time without any work being required, as owing to the many demands made upon them immediately after their return, it is almost impossible for them to render efficient service. He believes, however, that after a short vacation, to which they are entitled, the soldiers can be depended upon to do their work properly.

Others connected with the Debevoise-Anderson Co. who are or have been in the Army or Navy are:

New York Office: Stephen Meeker, lieutenant, junior grade, U. S. Navy, home and foreign service; W. J. Callow, second lieutenant, ordnance, France; H. M. Ellsworth, sergeant-major, infantry, France; Harry Harbough, field clerk, France; H. M. Ridoux, U. S. Navy, home and foreign service; A. E. Kelly, infantry; Vivian Bowden, British Medical Corps, France; Philip F. Hanahan, field clerk at Panama.

Boston Office: Joseph M. Norton, 33rd Engineers, France; M. Murdock, Engineers, France.

Lieut. Standish Meacham of Rogers, Brown & Co., Cincinnati, who left for France in June, 1917, and after a short period of service with the Y. M. C. A. enlisted in the Army, returned last week on the New Hampshire. Lieut. Geo. E. Home and L. D. McLaren are recent additions to the sales force of Rogers, Brown & Co. Mr. Home for the present will work from the Cincinnati office and Mr. McLaren from the Chicago office.

Justin R. Weddell, former sales manager of the Corday & Gross Co., advertising agency of Cleveland, has been appointed advertising manager of the Fire-

stone Tire & Rubber Co., Akron, Ohio. He entered the advertising field over 10 years ago, and has been in his last position for three years.

L. S. Devos has recently been appointed general manager of the machinery department, American Machinery Syndicate, 35 West Thirty-ninth Street, New York. From October, 1917, to the latter part of December, 1918, Mr. Devos was the chief of the inspection department of the United States Air Service, with offices in Paris, France, during which time he came in touch with all the factories and dealers of the whole mechanical field in France and Switzerland. Previous to his entry into the Army Mr. Devos was the New York representative of the Selson Engineering Co., Ltd.

Clyde M. Carr, president Joseph T. Ryerson & Son, Chicago, left for his winter home in California on Feb. 5.

Alden R. Ludlow, former vice-president of the Liquid Carbonic Co. of Chicago, has assumed his new duties as second vice-president and sales manager of the Air Reduction Co., Inc., of New York.

Hardy Greenwood, 915 Busch Building, Dallas, Tex., for many years southwestern representative of Alan Wood Iron & Steel Co. and the Youngstown Sheet & Tube Co., has relinquished the former account and will hereafter represent only the Youngstown Sheet & Tube Co.

J. A. Keller, Jr., has joined the sales force of the Jones & Laughlin Steel Co., and will travel out of its Cincinnati office.

John C. Wallace, Jr., has resigned as purchasing agent for the Pacific Coast Steel Co., San Francisco, after seven years' association with the company. He will enter business for himself on March 1, having announced the establishment of eastern connections for iron and steel products with headquarters in Pittsburgh.

Arthur T. Murray, president Bethlehem Motors Corporation, has been made president of the American Bosch Magneto Corporation. Mr. Murray was appointed managing director of the Bosch holdings in America when they were taken over by the Alien Property Custodian. He will remain the active head of the Bethlehem Motors Corporation.

Lieut. Frank Wollaeger, Jr., secretary Kempsmith Mfg. Co., Milwaukee, milling machines, has resumed his active duties following his honorable discharge from the army after nine months' service.

Robert G. Hayssen, secretary-treasurer Sterling Motor Truck Co., West Allis, Milwaukee, was elevated to the presidency of the company at the annual meeting of stockholders. Mr. Hayssen succeeds Victor L. Brown, who has retired.

Richard P. Tell, president and general manager National Brake & Electric Co., Milwaukee, was re-elected president of the Milwaukee Metal Trades and Founders' Association, at the annual meeting held Jan. 30.

Frank E. McIntyre, general superintendent National Steel Foundries, the foundry division of the National Brake & Electric Co., Milwaukee, retired from the position on Feb. 1 to assume active duties as vice-president and general manager of the Hercules Steel Casting Co., Milwaukee, which commenced operations in its new plant at 887 Robinson Avenue during the past week.

Warren W. Baker and Francis Carr of the Pennsylvania Steel Export Co., Widener Building, Philadelphia, will sail from Portland, Me., Saturday, Feb. 8, for England and France. Mr. Baker will be abroad six weeks, but Mr. Carr will stay in Europe for six months, visiting all of the principal countries, where agencies of the Pennsylvania Steel Export Co. will be established. The company will have an exhibit at the annual Lyons Fair in March.

Peter J. Hopkins, formerly New York district sales manager for the Cleveland Punch & Shear Works Co., Cleveland, but more recently with the Fore River

Shipbuilding Corporation, Quincy, Mass., has been appointed Pittsburgh district sales manager for the Cleveland Punch & Shear Works Co.

Harry R. DeGroat, well known in the eastern Pennsylvania scrap trade, has resigned from the Perry, Buxton, Doane Co., Philadelphia, to join A. M. Wood & Co., Inc., in an official capacity. He has acquired a financial interest in the latter company. A. M. Wood & Co., Inc., will move their offices from the Commercial Trust Building to the Finance Building, City Hall Square, Philadelphia.

Samuel H. Moon of Louisville, who for several years was with the Louisville branch of the Standard Sanitary Mfg. Co., having recently been transferred to Pittsburgh, has been made vice-president of the company. Theodore Ahrens of Louisville was re-elected president.

Dr. Thomas S. Baker, director of Jacob Tome Institute, Port Deposit, Md., has resigned, and on March 1 will become secretary of the Carnegie Institute of Technology, Pittsburgh.

Harry C. Cromwell of the mechanical and engineering department of the Baltimore & Ohio Railroad Co., Baltimore, and associated with that company for 20 years, has resigned and become mechanical engineer and general superintendent of the Boyden Co-ordinating Car Corporation, Baltimore.

John D. Culbertson, Jr., has been elected vice-president of the Duer Spring & Mfg. Co., N. S. Pittsburgh.

E. Howard Reed, vice-president Reed & Prince Mfg. Co., Worcester, Mass., is in the naval service and has been transferred from the torpedo station at Newport, R. I., to duty at Toledo, Ohio.

Past President Charles T. Main, when on his return from assisting the French Government on reconstruction problems, attended a welcoming meeting and dinner at the Engineers' Club, Boston, Jan. 31, and related many experiences to his hosts, the members of the local section, American Society of Mechanical Engineers.

Charles Dreifus, president C. Dreifus Co., dealer in old material, Oliver Building, Pittsburgh, has gone to Florida on a vacation.

James M. Atchison, special agent of the H. C. Frick Coke Co., has gone to Florida for his annual three months' vacation. Before leaving he was given a dinner by the associate heads of the company in Pittsburgh, in the Duquesne Club. There were 16 guests. Brief addresses were made by W. H. Clingerman, president of the H. C. Frick Coke Co., Mr. Atchison and others. Mr. Atchison has been connected with this company, in various capacities, for over 30 years.

Robert H. Schutz has been elected president and treasurer of the Smyth Mfg. Co., Hartford, Conn., succeeding the late John C. Wilson. Mr. Schutz is also president of the Sigourney Tool Co., and a director in the Standard Screw Co.

Henry C. Fownes, president Standard Seamless Steel Tube Co., Pittsburgh, has gone to Pinehurst, N. C., to attend a midwinter golf tournament.

At a recent annual meeting of the American Frog & Switch Co., Hamilton, Ohio, L. F. Phipps, who has been president of the company since its organization, retired from the presidency and became chairman of the board of directors. E. S. Griffis was re-elected treasurer and W. H. Babbe chief engineer.

L. W. Hench, power sales engineer of the Mahoning & Shenango Railway & Light Co., Youngstown, Ohio, has resigned to become general sales manager of the International Oxygen Co., New York.

Clarence H. Howard, president Commonwealth Steel Co., St. Louis, and his family have sailed for Europe.

Sydney E. Anning has been appointed sales agent of the Sharon Steel Hoop Co. for Cincinnati district, vice L. A. Burrell, resigned. Mr. Burrell will remain with the Sharon organization in an advisory or a consulting relation. The headquarters of the company will be in the Union Trust Building, Cincinnati.

Mark Workman, president of the Dominion Steel Corporation, Sydney, N. S., will sail for Europe in a few days to confer with certain interests with respect to the reconstruction program and to be on the lookout for new business.

Charles R. Robinson, recently elected vice-president of the Lackawanna Steel Co., in charge of sales, went to the Lackawanna company in 1908 from the Inland Steel Co., Chicago, and was at that time made district sales manager at Chicago. Two years later he was made general sales manager of the Lackawanna company, with office in New York. When the general offices of the company were removed to the plant at Buffalo, in 1911, he transferred his headquarters to that city, continuing in the position of general manager of sales until his recent promotion.

C. W. Simonds, superintendent of the steel car wheel plant of the Cambria Steel Co., Johnstown, Pa., has resigned, effective Feb. 1.

H. R. Shick, formerly in the blast-furnace department of the Pittsburgh Steel Co., Monessen, Pa., resigned, effective Feb. 1, to become general superintendent of the blast-furnace department of the Cambria Steel Co., Johnstown, Pa., succeeding A. J. Farabaugh, who recently resigned.

Edwin M. Wood, traffic manager of the Truscon Steel Co., Youngstown, Ohio, has resigned, effective about Feb. 15, and will engage in business on his own account in Detroit. Charles L. Maxwell, formerly assistant traffic manager, succeeds Mr. Wood, the latter to have headquarters at Detroit.

H. W. Nyhof and K. Loggen, with headquarters in Amsterdam, Holland, were in Pittsburgh last week, visiting steel plants in that district, and placing contracts for structural steel to be used in the Dutch East Indies for the construction of sugar and tobacco factories.

In the interests of Cuban trade, L. M. Vidal, director-general of the Havana, Cuba, branch office of the Quaker City Corporation, manufacturers, exporters, importers, arrived last week in Philadelphia. The first of this week J. J. Polanco and W. M. McGlinchey, assistant secretary of the Quaker City Corporation, accompanied Mr. Vidal upon his return to Havana to study trade conditions.

Major O. C. F. Randolph, formerly of the United States Army Engineering Corps, has become associated with the H. K. Ferguson Co., Cleveland, in charge of the sale of buildings to railroads. He is a graduate of the University of Illinois and was formerly in the bridge department of the Michigan Central Railroad, later construction engineer of the Timken-Detroit Axle Co. and after that construction superintendent of the Austin Co., Cleveland, leaving that company in July, 1917, when he was commissioned second lieutenant in the 16th Railway Engineers. In France he was in charge of building work on railroad and hospital construction, and he was in this country organizing a sapper regiment at the time the armistice was declared.

H. F. Holloway, district sales manager in New York for the Jones & Laughlin Steel Co., Pittsburgh, who has been in charge of the company's Washington office for a year and a half, has returned to the New York office.

At a special meeting of directors of the Allied Industries Corporation, New York, Jan. 22, Alfred I. duPont, Wilmington, Del., was elected president. He was succeeded as chairman of the board by Robert Pennington. J. H. Nixon has been appointed vice-president.



C. R. ROBINSON

general manager; J. L. Dashiell, comptroller; and G. W. Fay, secretary and treasurer.

J. Frederick Byers, president A. M. Byers Co., Pittsburgh, manufacturer of wrought iron pipe, has been elected a director of the Union Trust Co., of that city.

V. G. Engelman, for a number of years assistant buyer for the Timken-Detroit Axle Co., and later the Continental Motor Corporation, Detroit, has been commissioned a second lieutenant in the Reserve Ordnance Corps, U. S. Army. He received his honorable discharge recently, and has returned to his home in Detroit. He was located at Camp Hancock, Ga., as instructor.

E. Logan Hill, secretary of the United States Shipping Board Commission on Port and Harbor Facilities, has resigned and become associated with Heyl & Patterson, Inc., contracting engineers, Pittsburgh, and will be located in their New York office, 90 West Street. Previous to his appointment as an official of the Shipping Board, Mr. Hill was assistant general manager of the Erie Railroad.

William Blake Patterson, president Patterson Tool & Supply Co., Dayton, Ohio, has been appointed special representative in Italy and Switzerland for the Monarch Machine Tool Co., Sidney, Ohio, manufacturer of lathes, and expects to sail for Italy this spring. Mr. Patterson will retain his position and interests in the corporation of which he is president.

John V. Powers has been appointed Pacific Coast representative of Naylor & Co., 120 Broadway, New York.

Robert Bentley, president Ohio Iron & Steel Co., Youngstown, Ohio, has been elected vice-president of the First National and Dollar banks of that city, succeeding H. H. Stambaugh, who died Jan. 4 at New Orleans. R. C. Steese, director of the Brier Hill Steel Co., was chosen a director of the Dollar bank to succeed Mr. Stambaugh.

Thomas W. Pangborn, president Pangborn Corporation, of Hagerstown, Md., has been elected a director of the Maryland Surety & Trust Co., Hagerstown, Md., one of the largest financial institutions in the state.

J. H. Van Campen, formerly with the Bethlehem Steel Co., and later with the Western Steel Co., Weirton, W. Va., as chief draftsman, has resigned to become steel plant engineer of the Timken Roller Bearing Co., Canton, Ohio.

A. J. McDonald, formerly purchasing agent for the Martin-Rockwell interests in Philadelphia, has become manager of sales for the Lebanon Steel Foundry, electric furnace steel castings, Lebanon, Pa.

George E. Dix, assistant to the general manager of sales of the Midvale Steel & Ordnance Co., Philadelphia, has joined the sales organization of the Consolidated Steel Corporation, New York, and will have charge of sales of rails, plates, shapes, bars, locomotive and car wheel tires, forgings and specialties.

C. L. Jamison, secretary and treasurer of A. M. Byers & Co., Inc., Pittsburgh, makers of wrought-iron pipe, has returned to his duties in that city, after spending some months as captain in the Quartermaster's Corps, and assigned to the department of Director of Finance at Washington.

Revising Coke Contracts

UNIONTOWN, PA., Feb. 4.—Developments of the past week incident to the readjustment and transition of the iron and steel industry to a post-war basis and its effect upon the Connellsville or Fayette County region have brought out some interesting features. One of the most important is the general revision of coke contracts made conditional upon a readjustment in event war should end before the expiration of the term or that Government price regulations should be discontinued.

Independent operators have been offering to renew these contracts on the basis of \$5.50, a drop of 50c. over the Government price. Furnace men generally

have been holding out for \$5. Opinion in coal and coke circles here is that there has not been a general closing of contracts on the new conditions, but it is believed that the next few days will see practically the entire output of the region during the period until June 1 tied up at satisfactory prices.

The H. C. Frick Coke Co., at Scottdale, states that it expects no material change in the production and does not expect any change in the wage scale. The Frick company, producing about one-half of the region's output, serves as the barometer of conditions in the region.

Machinery Dealers' Convention

The eighteenth annual convention of the Southern Supply and Machinery Dealers' Association will be held in the Grunewald Hotel, New Orleans, Monday, Tuesday and Wednesday, April 7, 8 and 9. During the same week, starting Tuesday, the Southern Hardware Jobbers' Association will meet in the St. Charles Hotel, New Orleans, which will enable these two jobbers' organizations, doing business in the South, to hold several joint sessions, in which trade problems peculiar to the South in these respective lines can be thoroughly discussed. Invitations have been extended to the American Supply and Machinery Manufacturers' Association to meet jointly with the former and, as usual, the National Hardware Association will hold a meeting with the Southern Hardware Jobbers. The National Supply & Machinery Dealers' Association has also been invited.

Ford Motor Co. Operations

During the fiscal year of the Ford Motor Co., which ended July 31, 1918, there was made a total of 706,584 Ford cars, passenger cars and trucks, for public sale. This is only 78,848 less than in 1917, when the Ford plant had its biggest year, with an output of 785,432 cars. In a statement issued a few days ago it was said that had it not been for the war production would have totaled 900,000 cars. It also appears from the statement that the Ford company was given the order to make all bearings for all Liberty motors made in the United States. Two other vital parts for the Liberty motor made at the Ford plant were cylinders and forgings. The 1919 campaign of the company calls for an output of 1,000,000 cars, with 1,500,000 in 1920.

U. S. Chamber of Commerce Meeting

ST. LOUIS, Jan. 29.—The seventh annual convention of the United States Chamber of Commerce will be held at St. Louis the week of April 28, according to an announcement made by Paul V. Bunn, secretary of the St. Louis Chamber of Commerce. It is expected that 3000 delegates will attend. Headquarters and probably sectional meetings will be held at the Hotel Statler, but the general meetings will be conducted at the Coliseum.

Will Build Plate Mill at Hamilton, Ohio

The Dominion Foundries & Steel Co., Hamilton, Ohio, will build a plate mill with a capacity of 10,000 to 12,000 tons per month. The mill will be similar to that recently finished for the Steel & Tube Co. of America, Chicago, and will roll 42-in. universal and 84-in. sheared plates. A more extensive program is in contemplation.

Royal R. Keely, sales and industrial engineer for several years in a consulting practice, has affiliated with export engineers in Scandinavian countries and Belgium. An office has been established at 7 Vodrofsvej, Copenhagen V, Denmark. As soon as conditions will permit an office will be opened in Brussels, Belgium, with native sales and export engineers, having American experience, in charge of each. Catalogs and trade literature are requested; address New York office, 12 East Forty-fourth Street, until March 1; after that date, Copenhagen. He is interested in the following lines: Office and factory equipment and machine tools, electrical specialties, belting, builders' hardware, farm machinery, household utensils, etc.

OBITUARY

Wallace H. Rowe

Wallace H. Rowe, president Pittsburgh Steel Co., died at his home in Shady Side, Pittsburgh, Feb. 1, after an illness of about 18 months. Mr. Rowe was born in St. Louis Feb. 15, 1861, and was educated in the private schools and colleges in Missouri. In 1883 he entered the employ of the firm of J. W. Gates & Co., St. Louis, wire manufacturers, as a clerk. He remained there until the above firm merged in 1885 with the St. Louis Wire Mill Co., of which John W. Gates and William Edenborn were the heads, and remained active in that company until 1886, when he removed to Pittsburgh to take the position of treasurer and general manager of the Braddock Wire Co. That company was merged later with several wire companies into the Consolidated Steel & Wire Co. of Illinois, with general offices in Chicago, Mr. Rowe remaining in Pittsburgh as manager of all the Pennsylvania plants of the company. In 1898, when the Consolidated Steel & Wire Co. was merged into a new company, called the American Steel & Wire Co. of Illinois, Mr. Rowe remained in Pittsburgh, acting in the same capacity in this company as with the Consolidated company. This position was retained until after the absorption of the American Steel & Wire Co. by the United States Steel Corporation early in 1901.

On May 25, 1901, Mr. Rowe organized the Pittsburgh Steel Co., and started the building of the plant at Monessen, Pa. With this company was merged the Pittsburgh Steel Hoop Co., with works at Glassport, Pa., in which Mr. Rowe was largely interested, and one of the original incorporators.

Mr. Rowe was also a large stockholder and director in the Pittsburgh Steel Products Co., with works at Monessen, Pa., president of the Monessen Coal & Coke Co., and the Pittsburgh Steel Ore Co.; vice-president of the Pittsburgh Ice Co., and a director of a number of banks and insurance companies.

Mr. Rowe took an active interest in philanthropic, educational and religious movements. He was a director and trustee of the Shadyside Academy, and before his illness had been interested in plans looking to the enlargement and better equipment of that institution. He was an intense and ardent patriot, and was constantly thinking and planning for the Americanization of all workmen connected with his company. He was one of the first of modern business men to advocate temperance policies in connection with his plants, and his support of every forward ethical movement was always assured. One of his last benefactions was the donation of an X-ray equipment in connection with the military hospital near his summer home at Coburg, Ontario. At the time of his death he was president of the board of trustees of the Shadyside Presbyterian Church.

Mr. Rowe first suffered a breakdown in health in September, 1917. For months his life was despaired of, but he rallied, and during the summer of 1918 almost regained his normal health. He suffered a relapse, however, in October, 1918.

J. J. McCABE, president of the J. J. McCabe Lathe & Machinery Corporation, Singer Building, New York, who died recently, was one of the notable figures of

the machine-tool industry. Mr. McCabe was for years one of the largest dealers in the country, particularly in the second-hand machinery field. As a dealer, Mr. McCabe at different times had the agencies in New York for such companies as Schumacher & Boye, Smith & Mills Co., Carlton Machine Tool Co., G. A. Gray Co., and other builders of machine tools. In the used-machinery business, Mr. McCabe 35 years ago succeeded to the E. P. Bullard Co., New York, with which he had been associated since boyhood. Mr. Bullard, after selling this company, founded the Bullard Machine Tool Co., Bridgeport, Conn. Mr. McCabe also entered the manufacturing field, having been identified with a well-known double spindle lathe, which he himself designed and had manufactured under his patents. A few years ago Mr. McCabe founded the present J. J. McCabe Punch & Shear Co., with a plant at Chattanooga, Tenn. During the year prior to his death Mr. McCabe had not been active in business. He is survived by his wife and four children. Two of his sons, J. J. McCabe, Jr., and Raymond J. McCabe, have been associated with him in business for a number of years, and they will continue the J. J. McCabe Lathe & Machinery Corporation and the J. J. McCabe Punch & Shear Co.

EBENEZER C. HAY, president Hay Foundry & Iron Works, Newark, N. J., died at his home at Newark on Jan. 31, at the age of 81. He had been ill for the 11 weeks preceding his death, but until that time he had worked daily in the office. The foundry had been established by his father, James B. Hay, a native of Edinburgh, Scotland, in 1830, in Market Street, near Beaver Street, Newark. From modest beginnings the firm grew in importance of output, structural steel being added, and many contracts for structural steel obtained. After securing his education in a private school in Newark, Ebenezer became associated with his father. In turn, his sons John Lewis Hay and James Bruce Hay, the only members of the immediate family surviving, became associated with him, and will carry on the business. He was a director of the Union National Bank of Newark, and of many other financial interests. He was also a member of the Masonic order.

LAIRD H. SEIBERLING, former general manager Western Drop Forge Co., Marion, Ind., died on Jan. 6.

MARO V. PALMER died of heart failure on Jan. 29, following an operation. He was born in 1848, became a machinist, and was master mechanic with paper manufacturers before going to Willimantic, Conn., 35 years ago. There he was mechanical engineer for the American Thread Co. until 1914, when he retired. He was a prolific inventor.

ELMER L. EWING, secretary and acting treasurer of the Sharples Separator Co., died at his home in West Chester, Pa., of pneumonia, on Jan. 30, aged 34. He entered the employ of the company June 1, 1907, in the manufacturing department, and worked himself up through successive positions to the office of secretary, to which he was elected Feb. 19, 1916.

FRANK W. ROSENBERG, founder and president F. Rosenberg Elevator Co., Milwaukee, manufacturer of electric freight and passenger elevators, died Jan. 25 at the age of 61 years. He established the company with his five sons in 1905.

LIEUT. LOUIS B. BROWN, formerly chief chemist at the American Steel Foundries, St. Louis, died last week at a hospital in Washington, from wounds received several months ago in France. He was 28 years old.

DAVID R. DALY, for many years manager of the J. H. Gautier Crucible Co., Jersey City, died on Feb. 3 at his home in New Milford, N. J., after a long illness. He was 65 years old and had been employed by the company since boyhood.

EDSON WILLEY ALDEN WATERHOUSE, president Waterhouse & Lester Co., San Francisco, died at his home in San Francisco, Jan. 28, aged 45. In the year of the San Francisco Exposition he was president of the American Iron, Steel and Heavy Hardware Association.



WALLACE H. ROWE

Book Reviews

The Shipbuilding Industry. By Roy Wilmarth Kelly and Frederick J. Allen. Pages, xx + 302, 5½ x 8½ in.; illustrations, 103. Published by Houghton Mifflin Co., 4 Park Street, Boston. Price, \$3.

The book treats very completely the large field suggested by the subject, giving the history of shipbuilding in this country, facts about the present, and speculation about the future. The authors, director and assistant director, respectively, of the Harvard Bureau of Vocational Guidance, naturally consider the industry from the standpoint of the man who contemplates entering it. Accordingly, many pages are devoted to detailed description of each department, its routine of work, type of craftsman, chance for promotion, and knowledge and experience needed to enter.

Most of the subject matter pertains to the construction of the steel ship. A non-technical description is given of the tools, machines and methods of converting steel plates, billets, rivets, structural steel, etc., into the finished merchant ship. When the explanations tend toward the technical, pictures are introduced to clarify them. The use of several tables systematizes the facts enumerated.

Following are the main subjects treated: The importance of shipbuilding, its history, products of the shipyards, progress from the blueprint to the finished ship, naval architecture, construction of the hull, the metal trades, woodworking shops, executive and clerical positions, the building of wooden ships, recruiting and training workers, future employment opportunities in American shipbuilding.

Charles M. Schwab, director general United States Shipping Board, has written an introduction for the book. One handicap in the effectiveness of the whole is due to the fact that it was written during the war, the sudden peace having changed conditions from those portrayed herein.

Storing. By H. B. Twyford. Pages, xv + 200, 6 x 9 in.; illustrations, 96. Published by D. Van Nostrand Co., 25 Park Place, New York.

This is a dissertation on the economic aspects and proper methods of storing by a member of the Otis Elevator Co. The book is designed chiefly for the large manufacturer, though the suggestions can well apply to the merchant and others carrying large stocks. Descriptions are given of modern trucks, counting machines, conveyors, bookkeeping machines, as well as of modern methods of conducting the storeroom. Many samples of printed forms found practical for the transactions of the storeroom are given.

The author claims that too many production managers inaugurate saving devices in the production departments, but neglect savings in storing. Too often, he says, the storekeeper's position is looked upon as unimportant and a man of small caliber is placed there. He discountenances the prevalent yearly shutting down of manufacturing plants for inventory taking, claiming that, in its stead, a "perpetual inventory" system should be used. Subjects treated are: economic questions, standardization of description of articles in storage, location and equipment of storeroom, storeroom appliances, manual operations, clerical work, receiving material, inspection and placing of material, and deliveries.

Modern Shipbuilding Terms. By F. Forrest Pease. Pages, 214, 5 x 7½ in.; numerous illustrations. Published by J. B. Lippincott Co., Philadelphia. Price, \$2.

The book defines and illustrates with actual photographs, the various parts of ships and ship machinery. The main portion of the contents, covering 102 pages, is devoted to an alphabetical list of words and phrases now used in connection with shipbuilding, each with a clear and concise definition written so as to be intelligible to one without a technical education. In many cases, in addition to the definition, the reference is made to the picture wherein the object may be seen in its relation to other parts of the ship. An appendix of 41 pages includes a list of shipyard trades and the duties

performed by each; discussions with illustrations of various methods of electric welding; a list of symbols most commonly used on blueprints, pamphlets, and parts to give location, name and operation; an explanation of the Isherwood system of shipbuilding; the use of acetylene, hydrogen and oxygen for cutting and welding; and a selected list of books on ship construction and equipment. A series of 82 plates shows the progressive steps in the construction of steel ships, including the assembling of a fabricated ship. These illustrations in nearly every case are taken from ships building, and the arrangement is such that if studied in order they will give a comprehensive idea of the modern system of shipbuilding.

The author is staff instructor, education and training section, Emergency Fleet Corporation.

Heaton's Annual—Commercial Handbook of Canada. Fifteenth edition, 1919. Pages, 510, 4½ x 7¼. Published by Heaton's Agency, Toronto, Can. Price, \$1.50.

This is a reference book with indexes, tables, maps, and a few illustrations. A chief feature is the section on natural resources, covering agriculture, fisheries, forest products, fur trade, mining and water powers, with cross references to special Government publications, from which complete information can be obtained. Among the other subjects are: customs tariff and regulations, official directory, postal information, insurance directory, shippers' guide, educational institutions, and war record of Canada.

The fourth edition of "The Starrett Book for Machinists' Apprentices," published by the L. S. Starrett Co., Athol, Mass., is now available. The book contains 176 pages, 4½ x 7 in., bound in red Athol leather. The publication is designed to answer in an authoritative manner questions as to how to do the every day work of the average machine shop. The different classes of work are taken up separately, the most common errors pointed out and the correct practice indicated. Attention is given to the proper use and care of tools, the reading of micrometers and verniers, bench work, lathes and lathe tools, grinding, belts, gears, etc. The book is essentially for the apprentice, but the machinist will find much of interest and value. Distribution is being made through the hardware dealers handling the Starrett line of tools, the price being 50 cents per copy.

A companion volume, "The Starrett Book for Machinists," of the same size and binding as the above, is now in print. This is a tabular presentation of information regarding machine-shop practice and the materials of manufacture. It is assumed that the reader is already familiar with machines and tools and their uses, the purpose being to help the machinist to a greater degree of efficiency.

"An Historical Review of Steam Progress" is the subject of Circular 1591, issued by the Westinghouse Electric & Mfg. Co., East Pittsburgh. The circular is a reprint of an article by Francis Hodgkinson, which appeared serially and is now gathered together in one publication with the intention of becoming a hand book on steam turbine progress. The early history of steam turbine engineering is gone into and each year's development, from 1899 to 1917, is recorded and the improvements noted. The booklet is illustrated with views of different types of impulse and reaction turbines, the construction of blading, valve chamber, governor, throttle valve, coupling and oil cooler being shown in detail. The publication is of value to designing and consulting engineers, and we are advised is being used in the Government training classes for junior engineers on steam engineering work.

The first number of the Educational Film Magazine, dated January, has made its appearance. Announcement is made that it will cover educational, scientific, agricultural, governmental, literary, historical religious, travel, social welfare, industrial and news motion pictures. The magazine is published in Aeolian Hall, 33 West Forty-second Street New York.

STAGES IN STEEL REFINEMENT

Beneficial Use of Silico-Manganese—How Ladle Linings Can Spoil a Good Steel

Some valuable comments on the various stages in steel making processes are found in a paper delivered recently by Alleyne Reynolds before the Ceramic Society (British). About 20 years ago the author was employed by Messrs. Vickers as manager of the open-hearth, crucible and other steel melting plants, and also of the gun and armor plate heat-treating plants. His comments on the various steps in making steel follow in abstract:

Steps in Proper Steel Making

The first step in the manufacture of steel must be in the regenerative blast furnace or its equivalent, the non-regenerative electric semi-arc vertical shaft furnace, in which the charge column above the reaction zone forms the most perfect regenerator that can be designed. The sole difference between the blast and the electric furnace is that owing to avoiding transmutation of energy, one works more cheaply and more regeneratively with less radiation losses by employing the total fuel in the large blast furnace. The gases are alike in composition except for the useful mass action of the nitrogen of the air blast.

The next process should be to treat the shaft furnace product by the acid open-hearth continuous process, using as much limestone as possible to remove the silicide of iron, but using no ore. Above the metal level and just below the top of maximum slag level, neutral or inert furnace brickwork is needed at the teeming side, as acid bricks would be fluxed by oxidation of iron into basic FeO. If large lumps of lime carbonate were used and kept well in the center of the bath considerable amounts of iron carbide would be removed without risk of fluxing the hearth.

The third process should be exothermic refinement to produce lime phosphate. Plenty of carbonate of lime, or lime and iron ore, should be used, and the process should be the Talbot process, but producing more commercially valuable slags owing to the acid process preceding it having been on logical lines.

The manufacture of pure iron is impossible and the manufacture of steel originated from attempts to produce iron. It was then found that steels, or alloys of excess reagents (deoxidizers), possessed better physical properties than iron was likely to possess, could it be made by a caloric process. Where skill comes in is in the last process of refining out the last traces of the refining agent. This is FeO. It would be out of place to omit reference to the pneumatic steel process and to omit to give credit for the discovery of its nature to Dr. J. E. Stead.

The proper sequence of separate stages of steel refinement must be the sequence of reactions in the Bessemer converter. The order of oxidation is, at low temperature, silico-manganese, silico-iron, carbon, phosphorus. At high temperatures silico-iron is not only not attacked but formed. Then the sequence is silico-manganese, carbon, phosphorus. In the basic process where phosphatic slags may be in existence as calorytes, in addition to silicate calorytes, the carbon reaction merely requires high temperature and is independent of the phosphorus reaction. Of course, mass action affects the case, but with process of refinement the metal becomes a more steady caloryte. Clearly then the fourth process which the author insists on must be a treatment by silico-manganese.

Advantage in Using Silico-Manganese

For years past the author has been trying to get metallurgists to realize that whenever steel is produced low in oxygen content it is always, and always has been, due to added or nascent silico-manganese, and nothing else. The best steel-makers add silico-manganese instead of awaiting its formation from silicide of iron and carbide of manganese. The reason acid steels are better than instead of inferior to basic is because steel-

makers cannot avoid its formation. The acid vessels provide for its formation at a greater rate than the formation of ferrosilicon and iron protoxide, and thus they provide passable steels.

Some ten years ago the author mentioned his ideas to the late S. B. Halcomb, the then technical managing-director of the old Sheffield crucible steel-making firm of Sanderson Bros. & Newbould, Ltd. (established in 1764), and he recognized at once that they accounted for hundreds of observed facts, especially those relating to dead-melting, in a manner that no other theories had done, and it led him and the author to making arrangements to co-operate in making trials with a view solely to providing proof, or disproof, of the basic theories in question, without regard to whether the steels produced were usable or even likely to be so. The main object was to provide preliminary evidence to justify expenditure on more costly trials, having in view producing evidence regarding the author's patented remedial process. As a result the author is enabled to furnish (as appendices, not reproduced here) what he believes to be trial results of a quite unique value as demonstrating the course of chemical reaction in steel manufacture. These trials are of additional value as being conducted under conditions pertaining to actual manufacture.

When steel is separated from the slag and contains any oxygen, as the temperature is degraded slags are formed, and these cannot be in equilibrium with the metal at the isothermal lines of freezing in the mold. In the result segregation of slags, gases and elements, or more correctly acidates, anhydrides and acidides takes place. Further acidides are held in solution in the superior phase portion. Usually the segregation has the effect of carrying the acidides into the eutectic, save of course the silicide of manganese which must be associated with the silicate of manganese. Sulphides of metals of the iron group being basides rather than acidides, are affected by the influence of the basic oxides.

Segregation in Ingots

The segregation in steel ingots increases with their size, and is really due to the action of traces of FeO which have not been removed, owing to omitting the making of the finishing process separate from, and in a separate apparatus to that employed for the refining process, and absolutely invariably exposing the steel after leaving the furnace to the action of a ladle lining, casting nozzles, and direct Bessemerizing influences which would undo the perfection of perfect steel subjected to such obviously bad treatment. The segregation is great in ingots of moderate weight. The steel-maker is put under the severest call on his skill as a metallurgist in the manufacture of heavy ingots for forging into the costly inner tubes for large guns, such ingots exceeding 100 tons weight.

It is a simple and easy matter to shield the steel absolutely from Bessemerizing influences, but nothing can render the production of perfect steel possible, and its perfection being reattained possible, except that it never comes into contact with any acidate which is not neutral or basic, from the commencement of its finishing process and thereafter. That is the problem which ceramists and steelmakers must at once realize is so important that it is almost a national sin to allow any expenditure of time and capital to stand in the way of it.

Harmful Effect of Ladle Linings

Quite apart from either serious action of acid ladle or tun-dish linings on the steel, there exists a defect that renders them incurably harmful. They become neutralized on the surface mainly by the formation of monosilicate of manganese. On emptying the ladle this thick glaze becomes very rapidly roasted, the protoxides of Mn and FeO being oxidized and becoming particularly effective oxide ores. On next filling the ladle these alone are enough to blight a perfect steel. Their reduction increases the amount of glaze, and when this has increased to a certain degree it floats off in bulk, leaving active silicate exposed to the steel. Yet some steelmakers are surprised at cyclic epidemics

occurring in their manufacture. Ceramists should note the danger of traces of alkalies in the materials used in the final stages of steel manufacture. They may facilitate all sorts of dangerous, obscure and subtle actions, perhaps nitrogenation of steel, the next greatest danger to oxygen.

Inasmuch as iron ores are mainly oxides, secondly carbonates and thirdly sulphides, it stands to reason that it must be most difficult to make iron dead free from oxygen, carbon, or sulphur, and the author fears no contradiction from any practical steelmaker who has essayed the problem.

Saving Money in Packing

WASHINGTON, Feb. 4.—The Bureau of Industries Research of the War Department has reported a series of interesting results achieved in the economizing of cargo space by improvements in packing methods.

For instance, the large number of motor trucks needed for the Motor Transport service overseas, the various types produced in this country for special service and the limited facilities for reassembling compelled the shipment of assembled vehicles on the decks and in the holds of cargo ships, resulting in considerable damage in transit. These vehicles when loaded on wheels occupied a greater area than was warranted by their weight, causing a loss in shipping space so extensive as to make this one of the most important of the space conservation problems. Standard trucks and automobiles, each occupying from 1200 to 1500 cubic feet, were finally condensed and crated in boxes occupying only one-fourth of that space. With the increase of assembling facilities and the training of motor mechanics, it ultimately became possible to ship practically all these automobiles in good condition, and in larger quantity than had been thought possible. Results obtained in the study of the packing and crating of mobile artillery were almost startling in the space saved, in the elimination of wasted packing materials and the certainty of safe carriage.

General standard specifications were prepared for baling, packing and crating. A Packing Service School was established at the Forest Service Laboratory in Madison, Wis., for the training of officers and enlisted men. Approximately 400 soldiers were carefully instructed how to inspect and bring to the attention of the bureau violations of the regulations and standard specifications. Recommendations by the Industrial Research experts for the improved crating of a single shipment of 2000 horse-drawn ambulances was calculated to effect a saving in shipping space of 300,000 cu. ft., roughly equivalent to the carrying capacity of a 500-ton cargo boat. In the case of an order for 6500 water carts, improved crating resulted in a saving of 279,000 cu. ft. of shipping space. At the valuation of cargo space at \$6 per cu. ft. this represents a saving in money of \$1,674,000.

An iron and steel plant costing \$10,000,000 will be erected near Amsterdam, Holland, the Government contributing one-third of the cost. The blast furnaces will be able to produce 500,000 tons of pig iron annually. The ore will come from France, Spain and Sweden; the coal largely from England; and second-hand equipment for the plant from Germany. An experienced French steelmaker has been named general manager, and skillful operatives will be available from Belgium and Germany. This is a new enterprise for Holland, and was launched because importations of iron and steel from other countries proved unsatisfactory.

The Standard Car Construction Co., Sharon, Pa., states that all the tools and machines for the addition recently made to its plate shop have been purchased, and most of them are now on the ground ready for installation when the new steel building to contain the plate mill addition is completed.

The Elwell-Parker Electric Co., Cleveland, has opened an office at 810 Broad Street, Newark, N. J.

Tungsten Ores in the United States

The production of tungsten ores in the United States in 1918, according to preliminary statistics collected by Frank L. Hess of the Geological Survey, was equivalent to 5065 net tons of concentrates, carrying 60 per cent tungsten trioxide, of which 5015 tons, valued at \$5,156,500, was marketed or consumed by the producers, and 50 tons was reported as left on hand at the mines Dec. 31. The output was less than that of the two previous years—1916, with 5923 tons, valued at \$12,075,400, and 1917, with 6144 tons, valued at \$6,783,400. The production in 1917 was the largest made by any country, although it was much smaller than the combined output of the British Empire.

Colorado produced 1910 tons of ferberite, California 1781 tons of scheelite and Nevada 885 tons of scheelite.

The prices of tungsten ores were fairly steady during 1918. Scheelite free from phosphorus, sulphur, and other harmful impurities brought about \$25 a unit most of the year. The other minerals brought from \$18 to \$25. At the end of the year wolframite of good quality that carried more than 60 per cent tungsten trioxide was offered in New York for \$12 a unit.

The imports during the year were much the largest ever made; for the first 11 months they amounted to 10,448 net tons, valued at \$10,224,668. As nearly as can now be determined, 3581 tons came from South America; 6465 tons from China, Hongkong and Japan; 260 tons from Mexico and 142 tons from other places.

Production of Dominion Steel Corporation

TORONTO, ONT., Feb. 3.—An estimate of the production of coal, iron and steel of the Dominion Steel Corporation, Sydney, N. S., for the calendar year 1918, would seem to indicate that production at the mines has been on a declining scale. The estimate gives the total production of coal in the year at 3,636,950 gross tons. This compares with a production of 4,279,772 tons in the fiscal year ending March 31, 1917, and 5,261,198 in fiscal year 1916. The decline in the coal figures is due in large part to labor difficulties and increased costs of operation. The same unfavorable influences are apparently responsible for the declines in the iron and steel production. Pig iron production in 1918 at 289,900 tons compares with 346,926 tons in the 1917 fiscal year and 329,664 tons in the 1916 fiscal period. The figures are as follows:

	Twelve Mos. End. Dec. 31, 1918	Twelve Mos. End. Mar. 31, 1917
Pig iron	289,900	346,926
Steel ingots	332,000	375,079
Bloom and billets for sale	69,000	144,051
Rails	114,350	17,495
Wire rods for sale	47,500	67,192
Merchant bars	850	5,259
*Wire nails, etc.	7,300	35,217

*1917 included wire used in manufacture of nails.

From the above it will be seen that the only item to show any kind of an increase is rails, which are some 97,000 tons higher than in 1916. While the total output of materials is somewhat disappointing, much progress has been made in the way of improvement of plant and equipment and in new undertakings for the enlargement and extension of the corporation's works.

The Truscon Steel Co., Youngstown, Ohio, manufacturer of steel products, intends to begin the making of pressed steel bars on a large scale. C. E. Danielson, formerly in the pressed steel department of the plant of the Sharon Steel Hoop Co. at Youngstown, is now connected with the Truscon company and will have charge of its pressed steel department. The company made a large quantity of shells for the Government, and has converted the presses used in this work to take care of its other needs. It has already built another unit to its plant at Youngstown to take care of the pressed steel department.

The Taylor-Wilson Co., McKees Rocks, Pittsburgh, will rebuild its foundry and machine shops recently destroyed by fire.

Detroit Manufacturers Are Hopeful

DETROIT, Feb. 4.—That unemployment in Detroit is at its peak this week, and that there will be no acute suffering in the city as the result of labor conditions, unless unforeseen developments occur, was the opinion of leading Detroit manufacturers and business men called by the Board of Commerce to discuss the situation.

According to the figures presented at the meeting there are normally 15,000 unemployed in Detroit who are either transitory or do not care to work. At the present time this figure has been increased to about 35,000, with a possible addition of 6,000 more this week, due to the temporary closing of the American Car & Foundry Co.'s plant and the laying off of the remainder of the men at the Lincoln Motor Co.

That the situation in Detroit is not so serious as these figures would indicate was the consensus of opinion at the meeting. Reports were presented showing that savings in the banks of Detroit are not only increasing month by month, but at a growing ratio, showing that the money is not being withdrawn for current expenses, as it would be in a serious unemployment situation.

Soldiers returning to Detroit are not furnishing as serious a problem as was expected, according to figures presented at the meeting. Between 13,000 and 15,000 service men have returned to the city. Of these, only 2,750 have applied for employment at the Government office, of which 70 per cent have been placed. Of the thousands who have not applied for employment the great majority have presumably gone back to their old places.

To keep in constant touch with the situation and take whatever steps might become necessary should an acute epidemic of unemployment be reached, a combined committee of the Board of Commerce, Employers' Association, and other civic groups, will be appointed. The measure most favored to prevent an increase of unemployment in the city was a general cleanup and repair campaign. It was pointed out that factories will find the present time most favorable for so-called "expense" work due to the greatly increased taxation. Concerns will be able to make necessary alterations in their plants, charging them to expense, and, through reduced taxation resulting, effect a considerable economy. That the "clean-up" idea should be extended to stores, warehouses, and most of all to private residences, was advocated at the meeting.

The Maynard Electric Steel Casting Co., Milwaukee, Wis., has installed a 3-ton Moore electric furnace, in addition to its Rennerfeldt furnace in its new foundry building and has other new equipment, including an electric crane. The capacity of the plant is about 500 to 600 tons of steel castings per month. This company established its business in 1912, operating at that time only a $\frac{3}{4}$ -ton Rennerfeldt electric furnace and the business was transacted in a small building until 1917, when the controlling interest was acquired by Sylvester J. Wabiszewski and was conducted under the management of Frank Wabiszewski. Under the new ownership the business rapidly increased.

An estimate of probable requirements in automobile output, by Hugh Chalmers, chairman for the service committee of the National Automobile Chamber of Commerce, New York, based on normal growth in production of 40 per cent annually, places the output for 1919 required to make up recent deficit in production for domestic needs at about 3,000,000. It is estimated, however, that a shortage of 700,000 cars represents today the difference between actual production the last four years and that under this normal increment of 40 per cent.

The Pacific Coast Steel Co., Portland, Ore., has taken out permits for three buildings. The steel frame rolling mill structure will be 88x320 ft., and will cost \$40,000; the open-hearth building will be 88x320 ft., and will cost \$40,000. The open-hearth building, 104x147 ft., will cost \$41,000.

CORRESPONDENCE

Is There a Mystery in Russian Sheet Iron?

To the Editor: In the issue of THE IRON AGE of Dec. 19 you print a very interesting article on the manufacture of iron and steel in far away Russia. It is something rare to get facts and figures from that remote region. But being a retired old steel worker, the article naturally arrested my attention. I read it very carefully and noted that some of the plants were owned and operated by the government, others by independent companies, etc. But could not find anything stated about "convict labor," which I was inquisitive about. In my boyhood days over in Wales we were told time and time again that the Russian sheet iron was made in the Russian penitentiaries by life convicts. They worked in those prisons making sheets and never came out to give away the trade secrets of the processes of their manufacture, but died and were buried inside, so that the outside world should not get the secrets.

Then many years ago, when the Woods mill of McKeensport began making an imitation of the Russian sheets, it was whispered around that a convict had escaped out of the Russian prison and through him the secret had leaked out, and that the Woods mill was preparing to make a better grade than ever Russia made. The cartoons showed the bear down on his back and the eagle on top.

I have through curiosity made inquiries from time to time from sheet metal workers: does the sheet iron manufactured in the United States, Britain, France, Germany, Sweden or elsewhere compare with the Russian product? The answer has invariably been, "No," neither in quality nor finish. Now I wish to ask you or any of the many readers of THE IRON AGE who may be in a position to know is there any truth in the old story of its being a trade secret jealously guarded or is it a superior grade of ore worked altogether by charcoal? If there are any secrets known by convicts the recent revolutions that took place there most certainly ought to let the "cat out."

If you can throw any light on the mystery, please do so.

GRIFFITH S. DAVIES.

Wilkinsburgh, Pa.

[THE IRON AGE would welcome comments throwing any light on the subject.]

The twenty-ninth anniversary of the Employees' Insurance Association of the Republic Iron & Steel Co., Youngstown, Ohio, was observed at a recent dinner in the Y. M. C. A. building. This was the first meeting in two years, as no gathering was held last year because of war conditions. Report of J. H. Onions, secretary and treasurer, showed total receipts of \$33,591.28 for 1913, and disbursements of \$13,648.22, leaving a balance on Jan. 1, 1919, of \$19,943.06. During the year 378 members received benefits. Directors elected were Frank G. Walker, D. E. Leonard, David Dickey, John Morris, Stanley Daniels, Samuel Butler, William H. Parrock, L. T. Goodridge and T. X. Fitzgerald. Mr. Walker is president and Frank C. Cunningham vice-president.

Announcement has been made that four of the large self-propelling barges which the United States Railroad Administration will build for use on the Mississippi between St. Louis and New Orleans, La., will be constructed by St. Louis builders, headed by Edward A. Faust. The company to build the boats will be incorporated as the St. Louis Engineering Co., and with Mr. Faust are interested A. Ruemmeli, John J. O'Neil, former president of the Fulton Iron Works, and others.

The Chicago Pneumatic Tool Co., Chicago, has established its own branch at St. Louis, at 813 Hempstead Street, under the management of H. W. Bunker, district manager of sales. It will maintain a stockroom and service station at the location named, as well as district offices.

Government-Owned Blast Furnace and Steel Plant Proposed

A bounty of 50c. a ton on all iron ore mined and smelted in Canada is sought by the people of the district of Port Arthur, Ont., in a petition forwarded to the Dominion Government. The establishment of a blast furnace and steel plant, with the support of the Government, at or near Port Arthur, is also asked, the plans suggesting that \$15,000,000 be provided for the establishment of a Dominion Government blast furnace and steel plant, and that the interest for 30 years on 80 per cent of the actual capital invested be guaranteed; or, as an alternative, that the same guarantees be allowed as were extended to Canadian dry docks and shipbuilding plants, to the extent of about \$13,000,000. The petitioners state that over 90 per cent of the product of Canadian furnaces during the last 10 years was from imported ore, of which 58 per cent came from the Lake Superior mines of the United States, and the remainder from Newfoundland, and that a large tonnage of Canadian iron ores could be made available for use by some preliminary treatment, if the increased cost of such treatment were compensated for by a bounty, as the ores of the Atikokan Range require roasting, Loon Lake ores hand sorting, Magpie siderite ores calcining, and Moose Mountain and Bathurst ores concentrating. It is further stated that extensive areas of promising iron formations have been located in many parts of Canada, and it is reasonable to expect that the concentrations of merchantable ore will be found in these ranges when systematically exploited, especially on the Steep Rock, Mattewan, Kaministiquia, Nipigon, Little Long Lake and Michipocoten district.

Detroit Munition Manufacturers Organize

Detroit munition manufacturers have perfected the organization of a local branch of the National Association of Manufacturers of War Material and will co-operate with the national body organized recently in Cleveland to expedite the settlement of war contracts by the Government. J. J. Crowley, president of the Detroit Board of Commerce, was appointed president of the organization, which is made up of 125 munition manufacturers. He will select an executive committee of three.

On the committee which called the meeting are Alvin Macauley, president of the Packard Motor Car Co.; A. R. Demory, Timken-Detroit Axle Co.; H. W. Hoyt, vice-president and general manager, Great Lakes Engineering Works; H. H. Rice, General Motors Corporation, and other leading manufacturers.

Equipment for Road Building

The road building program that is planned in the various parts of the country for this year is expected to create an unprecedented demand for various lines of industrial equipment, including cars, trucks, portable track, locomotives, small steam shovels and concrete mixers. A number of the states have money in their treasuries for road-building work which they were unable to start during the war, and will now go ahead with these various projects as soon as possible. In Illinois it is claimed that there is more work of this kind to be placed than there are contractors to handle the jobs. A heavy demand for contractors' equipment both for domestic use and for export, has sprung up during the past few weeks. Export orders are coming from all over the world. Although the demand is expected to be heaviest from France because of the great amount of reconstruction work to be done, orders are not coming from that country as rapidly as expected, the delay being attributed to the fact that it takes some time to finance the work. However, some orders for contractors' equipment have already been placed by France and the Lakewood Engineering Co., Cleveland, has recently taken a French order that has necessitated an increase of 100 to its working force over the number employed at the time the armistice was declared.

United States Chain & Forging Co. Organized

The United States Chain & Forging Co., Pittsburgh, has been organized and granted a charter under the laws of Delaware, with a capital of \$8,000,000, of which \$3,500,000 is preferred stock and \$4,500,000 common stock. The new organization is a consolidation of a number of chain manufacturers consisting of James McKay Co., Pittsburgh; Hayden-Corbett Co., with chain plants at Columbus, Ohio, and Huntington, W. Va.; S. G. Taylor Chain Co., Chicago, and the National Chain Co., Marietta, Ohio. Thus far officials of the new company have been elected as follows: J. T. Corbett, chairman of the board of directors; Robert J. McKay, president; C. M. Power, vice-president and sales manager; Frank A. Bond, secretary and general manager, and T. J. McKay, treasurer. The company is a very large manufacturer of chain and forgings, and in addition is making plans for the building of a large electric welding plant, which will likely be erected in the Pittsburgh district, but the exact location has not yet been decided.

Merchant Shipbuilding at Hamburg

Some insight has been given into German merchant shipbuilding plans during the war through a former employee of the Vulcan Werft, Hamburg, as reported by the War Trade Intelligence Department of Great Britain. The informant worked for that company from 1914 to 1917. During this period they were constructing chiefly torpedo boats and battleships. In 1914 there were 3000 hands, which was increased to 4000 in 1917. A merchant ship, The Bismarck, 52,000 tons, was constructed for the Hamburg-Amerika line and was launched in June, 1914. Since then, they have worked on her when they could spare material and labor, and now she is almost ready for post-bellum trade. Alongside this yard is another yard, almost ready for the Hamburg-Amerika line, where it is planned that 10,000 ton merchantmen will be built for post-war trade. He also stated that at the Reihestiegwerft, Hamburg, several standard ships of 4000, 8000 and 22,000 tons were constructed for use after the war. He said he knew of another yard where three or four merchantmen of 4000 tons were ready.

Exports of Tin Plate

WASHINGTON, Feb. 4.—The Bureau of Foreign and Domestic Commerce has compiled the following details of the exports of tin plate, terne plate and taggers tin by countries, during November, 1918:

Countries	Pounds	Dollars
France	1,906,651	136,168
Italy	1,663,737	153,812
Canada	16,646,147	1,364,190
Newfoundland	26,600	2,041
Trinidad	27,000	2,700
Cuba	783,970	71,656
Argentina	10,196,543	863,461
Brazil	174,089	14,987
Paraguay	42,847	3,218
Uruguay	4,267,318	358,520
China	323,943	23,439
Dutch East Indies	256,311	15,812
Hongkong	113,158	9,097
Japan	3,070,493	296,217
Australia	127,077	6,012
Philippine Islands	9,000	1,250
Total	39,934,884	3,321,166

For the import side of the ledger the figures for imports of tin bars, blocks, pigs, etc., by countries during the same month follows:

Countries	Pounds	Dollars
England	280,390	214,926
Canada	56,047	39,771
China	5,101	2,949
British India	56,000	44,897
Straits Settlements	7,704,006	5,801,573
Dutch East Indies	1,251,568	814,008
Hongkong	581,955	412,146
Australia	799,112	615,735
Total	10,734,179	7,946,008

NO TEMPORIZING

General Manager Piez Takes Positive Stand in Regard to Labor

SAN FRANCISCO, Feb. 1.—Mills, shops and shipyards are waiting to see what labor is going to do. In the Seattle field the answer of labor has already been made in a general strike, but in San Francisco there now appears some prospect that better counsel will prevail. The workmen in this field have the advantage of the knowledge that the patience of Uncle Sam has been exhausted, and this knowledge may be the deciding factor in the agitation for a strike that is now in progress. On Jan. 27 the local Iron Trades Council met to canvass the vote of the unions which have already registered their voice for work or strike. It was found that nine unions favor a compromise while six favor immediate strike. Twelve votes are necessary to carry the issue to a strike, and the votes of eight unions are yet to be canvassed. Probably the dominant factor in the decision of the men is the announcement made on Jan. 27 by H. A. Brotherton, special examiner of the United States Shipping Board, in charge of domestic relations, that there will be no temporizing with shipworkers striking over the Macy award. He says that in case of a strike of a prolonged nature the Government will cancel the ship contracts under which the men are working and that the yards will remain closed so far as Government work is concerned. "The Government is not so badly in need of ships that it will compromise on a question of principle," is a statement from General Manager Charles Piez, given out by Mr. Brotherton to the men. The threatened strike in the shipyards is independent of the controversy between the unions of the Iron Trades Council and the employers in the allied shops. Even if the shipbuilders do not strike there may be a strike among the various shops and foundries.

War Labor Board Decisions

WASHINGTON, Feb. 4.—The National War Labor Board has ordered the Alco plant of the American Locomotive Co. at Richmond, Va., to put into effect the agreement made last fall between the company and the employees of its Seventh Street plant. According to its findings, the agreement at the Seventh Street plant was signed two weeks before the Alco employees filed complaint with the board. Therefore, the board declares that the company should make the same concessions at the Alco establishment effective as of Dec. 3, 1918.

The board has also ordered a 10 per cent increase in the wages of the employees of the Western Drop Forge Co., Marion, Ind. At the plant of the Emerson-Brantingham Co., Batavia, Ill., the board ordered an increase of 10c. per hr. for all employees receiving less than 35c. per hr. July 15, 1918, and of 17c. per hr. for higher paid employees. This award is retroactive to Oct. 1, 1918. In the same decision the board declined to accede to the demands of the employees for the elimination of piece work, but it stipulated that "workmen engaged on piece work should be guaranteed their day's earnings upon the basis of the hourly rates herein determined."

Deadlock in Strike in Shipyards on Pacific Coast

SEATTLE, Feb. 3.—Of paramount importance to the Puget Sound district is the question of an early settlement of the shipyard strike, which on Jan. 20 caused a walkout of 25,000 metal trades shipyard workers and 10,000 employees of small contract shops engaged in foundry and allied work. The Metal Trades Council has adopted resolutions providing for a referendum on a sympathetic strike by its 130 affiliated unions as a means of forcing the shipyard workers' demands. That there is serious possibility of such a strike is generally admitted. The most important development in the situation is the statement by telegram to the shipyard owners from Charles Piez that the Fleet Corporation "stands by the Macy Board decision and will

do nothing more." Officials of the five big steel shipyards in Seattle have made the public statement that "the men must either return to work under the Macy award or shipbuilding, with its commensurate payroll, ceased in this community forever last Tuesday."

The situation presents all the phases of a deadlock, as the men assert that they will stand by their demands and refuse to recognize the Macy award. They deny having broken faith with the Government in any particular, and show every disposition of "standing pat" on their demands. Shipyard owners, on the other hand, are equally determined in their stand that the shipbuilding industry will not stand the strain of increased wages.

Foundry Workers' Strike Settled

Settlement has been effected in the strike of molders and coremakers in the foundries in the district embracing New York, Brooklyn, Jersey City and Hoboken. The agreement, which was signed last Friday, calls for an 8-hr. day with pay of \$5.75, these rates to be in effect for a year from date of Feb. 1, 1919. The molders and coremakers first walked out in four shops in Elizabeth, N. J., and in one in Carteret, N. J., on Jan. 8. Later adjustments were made in two of the shops in the former city, but the strike spread to Brooklyn, two shops being forced to close on Jan. 21, and the following day the movement embraced all the cities in the district.

Previous to the strike the foundry helpers and laborers of 13 shops in Greenpoint formed a union and became affiliated with the American Federation of Labor. Then they went on strike, but later went back to work at their old rates.

The general demand among molders and coremakers has been an 8-hr. day, with a minimum rate of 80c.; they had been working from eight to nine hours, getting from 72 to 74c., with a reported tendency to loaf on the job, thus making it possible for them to get in some overtime work. The foundry helpers asked for eight hours, with a rate of from 61 to 67c., a change from a 9 to an 8-hr. day at a 47 to 52c. rate.

General Electric Co. Strikers Return

The thousand strikers at the General Electric Co.'s plant at Pittsfield, Mass., have voted to return to work as fast as places can be found for them. Some 350 were re-employed the following day, Jan. 20; among them were two of the strike leaders. Anticipations were that by Jan. 27 all the strikers would get some kind of work found for them at the plant. About 4000 employees were originally involved in the strike, which began on Dec. 20 because of alleged discrimination against 10 employees at the General Electric Co.'s plant in Erie, Pa.

The Carpenter Steel Co., Reading, Pa., has granted an advance in wages of five cents an hour, with time and a half for overtime, Sundays and holidays. When the advance was announced it was stated that the attendance premiums, which had been paid by the company during the war period to insure steady attendance of workers, would be terminated at once. The company employs more than 2000 men.

The Fulflo Pump Co., Blanchester, Ohio, has brought out a new type of its lubricating pump, equipped with eight blades in place of four as employed on earlier models. The priming chamber has been enlarged also, and will admit, it is said, of a suction lift of approximately 3½ ft. without the aid of valves. An added efficiency of about 10 per cent is reported over the four-blade type.

An engineering society is contemplated at Springfield, Mass. A committee has been chosen to consider an organization of the local civil, mechanical, mining, architectural, electrical and chemical engineers and is headed by Charles L. Newcomb, manager Deane Steam Pump Works, Holyoke, Mass., as chairman.

CONTRACTORS' RELIEF

Two Houses of Congress Have Not Yet Taken Final Action

WASHINGTON, Feb. 4.—Disagreement between the two houses of Congress over the details of the contractors' relief bill again threatens to delay that highly important settlement.

After a complicated series of parliamentary tangles the Senate agreed upon a substitute for the Dent bill embodying the basic ideas approved by the United States Chamber of Commerce and representatives of the contractors. These provided for the same validation of informal contracts contained in the Dent bill, but sought to create a Presidential Appeals Commission to which either the contractor or the Department of Justice could appeal from the decision of the Secretary of War in the adjustment of contracts. It was this question of a commission to hear appeals that proved the chief stumbling block for the acceptance by the House of Representatives of the Senate measure. Another difficulty arose in the Senate acceptance of Senator Henderson's amendment to extend this relief to mine owners who had sought to develop rare minerals but faced a loss of between four and five million dollars because the armistice again opened foreign sources of supply.

Much pressure has been brought upon Washington to hasten the acceptance of the contractors' relief bill in some form to make it possible for banks generally to liquidate their heavy holdings of paper based on war contracts. Billions of dollars are thus tied up. According to information received by the Treasury Department and the Department of Commerce, this stagnation has done much to prevent the extension of building programs and the loosening up of industrial conditions to take care of new business. The Department of Commerce has undertaken to arouse a greater interest on the part of the banks in promoting building improvements and the expansion of enterprises, but so far without marked success.

Americanization Schools at Mid-West Plants

Americanization of the foreign-born non-English speaking workman is being given serious attention in many industrial establishments. Its feature as a stabilizer of labor is stated to be a valuable asset in plant management. Successful schools of this kind are being conducted in conjunction with the public schools in some mid-West cities.

The Firestone Tire & Rubber Co., Akron, Ohio, has placed the movement in charge of a complete working organization. Day classes are assembled under the direction of instructors furnished by the city board of education.

It has been shown especially in the work as carried on by the company that foreigners as a whole are suspicious, and that unless their treatment is opened fair and laid before them in such a way that misunderstanding is impossible, they are apt to stop the class work altogether.

Classes are divided according to the progress made by the student. Rudimentary English, reading, and the use of the English alphabet form the chief objects of study in the first classes. He is urged to read newspapers and magazines which chronicle current events with editorial comment, and by other means to obtain information relative to lands, governments and customs outside his native country. After a student completes a course as described herein he is given the privilege of passing an examination for citizenship papers.

The subject of naturalization has been greatly simplified by the fact that the local county common pleas judges have resolved to accept as final evidence that a man is ready for his second papers, his successfully passing an examination which has been prepared by the city teacher conducting the classes. This examination is in the form of a questionnaire. One of these questionnaires successfully filled out by an applicant

is accepted as conclusive evidence that the student is ready for his second papers.

Similar special courses at the plant of the Packard Motor Car Co., Detroit, consist in a combination of American history and civil government. The curriculum is designed for those who wish to acquire citizenship, and a certificate is given on completion of it.

Three years ago it was made a rule at the plant that promotion to positions of responsibility may be won only by citizens or those who have declared their intention to become citizens.

Every foreman has as one of his duties the encouraging of employees to enroll in the city's night school courses. He is charged with explaining to his fellow workers the advantages of an education, together with the opportunities it brings. The company keeps on file the records of employees attending night school, and these records are available to the foreman and the employment department as references when promotions are to be made.

Building in Prospect

The Division of Public Works and Construction Development of the Department of Labor is still carrying on a vigorous campaign to start up building operations throughout the country. Its publicity campaign insists that the country has a shortage of more than half a million houses. It has compiled the following list of new public building activities:

Buffalo has outlined an \$8,000,000 building program. Twelve new school houses will be built and work begins at once.

Indianapolis is rushing work on a gigantic scheme of track elevation. The work has been going on all winter. The city is starting in to remodel many of its school buildings.

Columbus, Ohio, is to have \$1,500,000 worth of new warehouses built by the Federal Government.

Bronx, N. Y., will build a \$200,000 school building.

Waterbury, Conn., is to build a \$150,000 school building.

State of Connecticut is to build a highway and trolley bridge near Stratford to cost \$900,000.

East St. Louis plans a community high school to cost \$100,000.

Cleveland Heights will spend more than \$500,000 on high school buildings.

Newark, N. J., is to have a \$400,000 boys' industrial school.

Massachusetts is to build a school for feeble-minded at a cost of \$150,000.

Cedar Rapids, Iowa, is planning work which will aggregate more than \$500,000.

A long list of buildings of private construction also has been compiled.

Nova Scotia Plant Closed

TORONTO, ONT., Feb. 4.—The Nova Scotia Steel & Coal Co., Ltd., has closed temporarily its plants, including the steel plant at New Glasgow and the coal mining operations at North Sydney. According to D. H. McDougall, president of the company, several of the plants had been during the past four years operated at high pressure. The present, when the cancellation of munitions contracts has left the tonnage on the company's order books at the lowest point of the past four years, is considered an excellent time to make repairs and renewals. New business, he stated, is offered to a very limited extent, and at prices which are not at present attractive to the company. General improvements will be undertaken at the coal mines, as well as above ground, where new and up-to-date by-product coke ovens will be installed. It is Mr. McDougall's idea to so develop the Wabana mines that the company will produce iron ore far in excess of its former outputs, and at materially reduced costs.

Recently the plant of the Crescent Mfg. Co., Fremont, Ohio, maker of safety razors, razor blades and general metal specialties, was partly destroyed by fire, but all damages have been repaired, and the company reports its plant as again in full operation. None of its machinery was destroyed, and the company is not in the market for requirements of machinery of any kind.

Machinery Markets and News of the Works

BETTER TONE IN MARKET

Fair-Sized Orders Are Placed for Tools

Prospective New Work Gives Promise of Gradually Increasing Demand for Equipment

Despite the many handicaps which the machine-tool industry is facing, which are not being lost sight of, there is a distinctly better tone in the markets, with actual buying showing an improvement which is notable in view of the quietness which has prevailed since the signing of the armistice.

The automobile industry has given evidence that it will go ahead regardless of high prices for equipment and materials. The General Motors Corporation placed orders at Toledo, Ohio, last week for a round lot of machines, and the Ford Motor Co., Detroit, has bought 60 vertical turret lathes from a New England builder and the Marlin-Rockwell Corporation, New Haven, Conn., bought 40 machines of the same type from the same manufacturer. These, it is understood, are also to be used for automobile work.

Great Britain's embargo on importation of machine tools, effective March 1, has had a somewhat discouraging effect on hopes for export trade, but British machine-tool distributors and agencies have placed fairly good-sized orders for stock, and many of these machines have been shipped. France is expected to become a large buyer of tools. It is expected that considerable business will come to this country from a collective buying syndicate which has been organized in France. Reports are that the purchases to be made by this syndicate will aggregate several million dollars, but nothing is expected in the way of actual orders for several months. A commission representing business and manufacturing interests in the Balkan countries is

also reported to be on its way to the United States to buy equipment for the rehabilitation of industries in that section of Europe. A Belgian buyer has been in Cincinnati, reviving rumors that Belgium will be a large buyer of machine tools in this country. It is probable that financing must be arranged before any buying is done.

Two French shipyard projects are now before the trade, each calling for a considerable quantity of equipment, mainly machinery for fabricating ship steel.

A Spanish buyer is in the market for a number of plate-working machines, presumably for a Spanish shipyard.

A project which gives promise of large buying of machinery and cranes is the Norfolk-Hampton Roads Ship Repair Corporation, which will expend about \$7,500,000 for what it stated will be the largest dry dock and ship repair plant in the world. A site has been acquired near Norfolk, Va., and two floating dry docks of a size to accommodate the largest ships afloat and two or three repair slips will be built, with all necessary shops for making repairs to ships. James Stewart & Co., New York, will construct the plant.

The Newport News Shipbuilding & Dry Dock Co., Newport News, Va., will go ahead with the large boiler shop at Richmond, Va., work on which was halted with the ending of the war. Orders had been placed for the building and for machinery, but whether these will be reinstated has not been made known. Probably new bids will be called for.

Reports are revived that Henry Ford & Son will build a tractor plant on Green Island, in the Hudson River, near Albany, N. Y., this site having been acquired by the Ford interests some months ago.

The Milliken Brothers Mfg. Co., New York, is in the market for 11 punches and shears and a horizontal bending machine for a fabricating shop.

New York

NEW YORK, Feb. 4.

While actual business in machine tools and allied equipment in the Eastern markets is still at a very low point, a number of projects have developed which give promise of an improved demand within the very near future.

One of the most important is the new dry docks and repair shops to be built near Norfolk, Va., by the newly organized Norfolk-Hampton Roads Ship Repair Corporation, which will expend about \$7,500,000 for the largest ship repair plant in the world. There will be two floating dry docks of sufficient size to accommodate the largest ships afloat and two or three repair slips, with all necessary shops for making repairs. A site has been acquired near Norfolk and work will begin very soon. James Stewart & Co., 30 Church Street, New York, will be in charge of construction.

Despite the cancellation of some shipbuilding contracts by the Emergency Fleet Corporation, the machinery trade has been encouraged by the announcement cabled from Paris that Chairman Hurley of the United States Shipping Board is on his way home to inaugurate an increased shipbuilding program. It is believed that this will mean increased work for the more efficient plants and the probability that the inefficient plants, some of which have ex-

hausted their Government appropriations without making much headway, will not receive further Government encouragement either in the form of contracts or appropriations. Ships of greater cargo-carrying capacity will be built, and this may require more equipment, especially plate-working machinery and cranes.

A large project allied to the shipbuilding industry which was abandoned when the armistice was signed, but which is now revived, is the marine boiler plant of the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., which will be built at Richmond, Va. It was decided last week to go ahead with this shop and probably orders will be reinstated for some of the equipment which was bought early last fall when the project was approved by the Emergency Fleet Corporation. A large list of cranes and considerable plate-working machinery was originally involved.

Luis Olano, 116 Nassau Street, New York, who has an office at Gijon, Spain, is in the market for equipment for a shipbuilding plant in Spain as follows: Plate-bending rolls, plate edge tapping machine, beam bending machine, portable hydraulic riveting machines, combined bar bending, horizontal punching and angle bar cutting machine, plate joggling machine and a hot flanging machine.

Foreign inquiry for shipbuilding equipment has appeared in the market. There are two shipbuilding projects for France, one of which is fostered by the Framericana

Industrial Development Co., 21 East Fortieth Street, New York, which has received quotations on a good-sized list of fabricating machines and machine tools. Russell B. Smith, consulting engineer, 50 East Forty-second Street, has issued a list for a shipyard in France, which in part is as follows:

Two 36-in. and two 48-in. vertical punches, each to be equipped with a punch table; also with roll tables between each pair of machines.
 One multiple punch and spacing table.
 One 36-in. vertical shear and one 42-in. vertical shear, each to be equipped with a 3-ton jib crane.
 One plate planer to handle 30-ft. plates, to be provided with 3-ton jib crane and with roll tables.
 One plate planer to handle 20-ft. plates.
 One rotary shear, 48-in. throat, with 3-ton jib crane.
 Two radial countersinking machines.
 One portable electric countersinking machine.
 One plate scarfing machine, equipped with 3-ton jib crane.
 One plate bending rolls, 30-ft.
 Two radial post drills.
 Two tool grinders.
 One portable electric scarfing machine.
 One 12-in. horizontal punch and two 18-in. vertical punches, each equipped with 2-ton jib crane.
 One angle shear, equipped with two jib cranes.
 One hydraulic frame joggling press.
 One horizontal bending and straightening machine, equipped with overhead trolley track or two jib cranes.
 One high-speed friction saw, equipped with jib crane.
 One angle planing machine.
 One angle shear with turntable base, equipped with two jib cranes.
 Two bolt-cutting machines.
 One angle-beveling machine.
 One set of plate-straightening rolls, equipped with 3-ton jib crane.
 One shape furnace and one plate furnace with two motor-driven blowers.
 One hydraulic ram.
 Eight forge fires.
 One 1000-lb. steam hammer.
 With this equipment is specified a number of small capacity cranes.

There is an improved domestic demand also for plate-working machines. The Milliken Brothers Mfg. Co., 136th Street and Locust Avenue, New York, is in the market for 11 punches and shears and a horizontal bending machine for a fabricating shop. The Tank Shipbuilding Co., Newburgh, N. Y., has bought a punching machine. The W. & A. Fletcher Co., Hoboken, N. J., has purchased a horizontal punch for its ship repair plant and the Tidewater Oil Co. has added to its fabricating equipment a punch and radial drill.

The automobile industry gives promise of providing a fair quantity of machine-tool business within the near future. The plans of the General Motors Corporation have excited interest, it being reported here that substantial orders have been placed by this concern during the past week at Toledo, Ohio. According to report this company will build a \$500 automobile at one of its subsidiary companies' plants. Another concern which it is reported will place a low-priced car on the market is the Willys-Overland Co., Toledo, Ohio, which the machine-tool trade understands will utilize a part of the Curtiss airplane plant at Buffalo for building such cars.

Another project about which there is considerable talk is the proposed tractor plant of Henry Ford & Son on Green Island in the Hudson River near Albany, N. Y. No definite announcement has been made by the Ford interests regarding their plans, but one story is that a very large plant will be built for building tractors for export trade. The plant will include one or more blast furnaces and ore will be brought by barges from lower Lake ports through the New York State canal. The barges, it is reported, will be built at the Ford Eagle plant near Detroit. If the project is carried out on such a large scale a large list of machine-tool equipment will undoubtedly be required. The Ford interests have been getting new quotations on a list of tools, but whether this is merely for estimating purposes the trade apparently has not learned.

Contracts are being placed by the automobile manufacturers for auto parts and some buying is coming as a result. Three Syracuse, N. Y., companies are or soon will be in the market for a fair amount of equipment, these being the Brown-Lipe Gear Co., New Process Gear Corporation and the Weekes-Hoffman Co., all of which are reported to have received contracts for automobile parts.

Many other projects are being talked about in the trade, but the manufacturers whose plans are discussed say that

they have not yet arrived at definite conclusions as to what they will do. A large Bridgeport company will, according to report, make tractor engines. It has also been reported that it will make typewriters, but machine-tool men are told that while a number of products have been under consideration nothing definite has been decided upon. A Boston company, prominent in the electric starter field, is said to have planned to manufacture electric motors. These reports illustrate the eagerness with which the machine-tool trade is seeking information that may lead to business. If these can be counted as prospects, there are many, but very little actual business at this time.

The disposal by the Government of new and used machine tools has not proceeded far. An office has been opened at 560 Madison Avenue by the Department of Aircraft Production, Machinery Disposal, for the sale of used tools which have been in aircraft plants. New York dealers and factory representatives have been approached to determine whether they are interested in the purchase of any of this equipment. Machine-tool sellers have been disturbed by reports that the Government is selling some new tools at reduced prices. A New York State plant, which had about \$300,000 worth of new equipment, is reported to have offered the Government 60 per cent of the invoice price of such machines as it desired to buy. The Government asked for 75 per cent and a bargain was reached with the difference being split. It was the understanding that tools would not be sold in such a way as to demoralize the market, but representatives of the tool builders insist that this method of disposing of Government tools, if persisted in, will greatly demoralize the market.

Prices of tools continue unchanged, but various discounts are being offered by some sellers, which are equivalent to a reduction in prices. Sometimes this reduction takes the form of a discount of 10 per cent or more for cash within ten days.

The announcement last week by the British Government that machine tools and other machinery had been put on the list of prohibited imports was disturbing to American machine-tool builders. The embargo takes effect March 1. British machine-tool houses, which have offices in New York, explain that the measure is purely one to protect Great Britain's finances. Many of the American tool builders have already shipped machines for stock to their British representatives, and it is believed that by the time more are needed the embargo will have been lifted. The text of the British order puts an embargo on the following machines, which can only be imported into Great Britain under special license:

Machine tools and machinery driven by power and suitable for use in cutting, stamping or working metal, including lathes, grinding machines, milling machines, boring and turning mills, drilling machines, power presses, planers, punching and shearing machines, shapers, forging machines, screw machines, cutting-off machines, chucking machines, gear-cutting machines, boring machines, centering machines, slotting machines. Machinery driven by power and suitable for use in cutting, working or operating on wood, including sawing machines of all descriptions, general joiners, mortise, tenon, boring machines, lathes and rounding machines, box and cask-making machines, and all machines accessory thereto, scraping and sandpapering machines, wheelwright machinery, firewood making and bending machinery, wood, wool fibre and pulp machinery, saw-sharpening and setting machines, saw stretchers and brazing apparatus. Machines for grinding, planing or molding irons, lawn-mowers, guns, carbines, rifles, revolvers, pistols, cartridges, wringers and mangles, weighing machines, scales and balances and vacuum cleaners.

The Ford Motor Co., Detroit, Mich., has commenced operations at its new plant at Kearney, N. J. The initial work is being devoted to assembling, with present average of about 50 chassis a day. It is expected to increase this to over 100 at an early date. The complete assembling department at the works is only partially finished and is not expected to be complete before summer, when a maximum of over 500 cars per day is planned. The plant is now giving employment to about 900 men, and this number will be largely increased as different departments of the works are occupied. I. S. Roe is local superintendent.

The Roller Bearings Mfg. Co., East Orange, N. J., recently organized with a capital of \$2,000,000, has acquired property at Main Street and the Erie Railroad, 115 x 585 ft., as a site for a plant. It has taken over the Hart Roller Bearing Co., with works at 512 Main Street, and will operate this business. A. C. Van Gassbeck is president.

The American Shell Co., 350 Twenty-first Avenue, Paterson, N. J., will complete its Government contracts about Feb. 15. The working force has been reduced to a minimum effective Feb. 1. Closely following it is understood that the machinery and equipment will be altered and remodeled to provide for the resumption of regular steel pipe manufacture by the East Jersey Pipe Works, which formerly occu-

pled the plant. It is expected to have this work accomplished within a few weeks.

Anton Louy & Co., New York, operating a plant at 511 West Twenty-first Street for the manufacturing of marine plumbing specialties, has had plans prepared for a reinforced concrete addition, 125 x 190 ft., on West Twenty-first Street running through to West Twenty-second Street, for the manufacture of metal lifeboats, etc. It is estimated to cost \$100,000.

The Madden Safety Razor Corporation, New York, has been incorporated with a capital of \$400,000 by C. L. Hays, C. B. Hobbs and C. A. Voetsch, 1125 Madison Avenue, to manufacture safety razors, etc.

Charles H. Westerberg, 9 West Broadway, New York, has incorporated a company to be known as C. H. Westerberg & Co., with capital of \$50,000 to engage in the machine-tool business. The other incorporators are C. Westerberg and E. Goehrig.

The Weyler Brass Foundry Corporation, New York, has been incorporated with a capital of \$10,000 by H. Weyler, A. Lashareff and V. Crasnoff, 205 West Eighty-fifth Street.

The Victory Envelope Machine Corporation, New York, has been incorporated with a capital of \$10,000 by M. J. Langdon, M. H. Nason and F. E. Lonas, 1790 Broadway.

The Stamping Products Co., 120 Broadway, New York, operating a plant at 13 Laight Street, will occupy a new works to be erected at 73-77 Wooster Street, at a cost of \$15,000.

The Victory Bottle Capping Machine Co., New York, has been incorporated with a capital of \$16,000 by E. A. Oliver, John P. Wickery and F. W. Muller, 1476 Broadway.

The United States Press Mfg. Co., New York, has been incorporated with a capital of \$150,000 by B. F. Waite, 2272 East Nineteenth Street, Brooklyn, and J. H. Waite, Wilkinsville, Mass., to manufacture printing presses.

The Generator Valve Co., 47 Dinsmore Place, Brooklyn, is planning the erection of a one-story foundry addition, 25 x 50 ft.

The Richard Wagner Co., New York, has been incorporated with a capital of \$75,000 by W. Lindberg, L. and Richard Wagner, 343 Sixth Avenue, Brooklyn, to manufacture marine goods.

The Public Service Commission, New York, has granted the Brooklyn Edison Co., Brooklyn, a consolidation of the Edison Electric Illuminating Co. and the Kings County Light & Power Co., permission to issue bonds for \$5,500,000, part of which, it is understood, will be used for extensions and betterment work to electric plant and system.

The Wood & Metal Products Co., New York, has been incorporated with a capital of \$10,000 by A. M. Tozzi, E. H. Smith and E. E. Gardner, 165 Broadway, to manufacture metal goods and wood specialties.

The New Rochelle Machine & Repair Co., New Rochelle, N. Y., has been incorporated with a capital of \$5,000 by M. A. Loftus, C. S. Schaffer and M. Smith, 233 Broadway, to manufacture machine parts, etc.

The National Aniline & Chemical Co., 21 Burling Slip, New York, will make alterations in its five-story works at East Eighty-third Street and Ditmas Avenue, Brooklyn, to cost about \$85,000.

The French Cabinet Co., Brooklyn, has been incorporated with a capital of \$300,000 by G. A. Collins, M. Rothman and M. D. Reardon, 149 Broadway, to manufacture cabinets and fixtures.

The Noma Motor Corporation, New York, has been incorporated with a capital of \$50,000 by F. Ammann, Sr. and Jr., North Hackensack, N. J., and W. W. Walton, 420 Riverside Drive, New York, to manufacture motors, machinery, etc.

James Shewan & Sons, foot of Twenty-seventh Street, Brooklyn, N. Y., operating a shipyard and boat-building plant, will build a one-story brick and concrete addition, 50 x 110 ft., to cost \$12,000.

The Bushwick Metal Bed Co., Brooklyn, has been incorporated with a capital of \$10,000 by G. Saresky, G. Himmelstein and W. Levine, 1794 Broadway, Brooklyn, to manufacture brass and iron beds, etc.

The Greenwald Display Fixture Co., New York, has been incorporated with a capital of \$10,000 by W. B. L. and J. L. Greenwald, 506 Amsterdam Avenue, to manufacture metal display fixtures, etc.

The Aircraft & Motor Products Co., New York, has been incorporated with a capital of \$25,000 by H. A. Dalley, C. Smith and H. A. Bubs, 299 Madison Avenue, to manufacture motors, aircraft parts, etc.

Swift & Co., 32 Tenth Avenue, New York, are planning the rebuilding of their fertilizer works, including boiler plant and other structures, at Kearny, N. J., recently de-

stroyed by fire with loss estimated in excess of \$100,000. The new plant will cost about \$150,000.

The Ashton Burial Case Co., Phillipsburg, N. J., has been incorporated with a capital of \$125,000 by Walter S. and Richard Ashton and Frank E. Kirtz to manufacture caskets.

The French Mfg. Co., 135 Jackson Street, Newark, N. J., has renewed its lease with the Universal Caster & Foundry Co. on property now occupied at 136 Adams Street for the manufacture of metal products. The lease also covers additional space to provide for expansion.

The S. & S. Supply Co., Newark, N. J., has been incorporated with a capital of \$50,000 by Henry M. Stern, Jr., Benjamin Staufenberger and J. E. Chapman, Irvington, to manufacture guns, etc.

M. R. Everett, operating an iron works on Avenue D, Newark, N. J., will make alterations to cost about \$8,500.

The Art Metal Works, 7 Mulberry Street, Newark, N. J., have leased the Birkenhauer & Bauman brewery property at South Orange and Morris avenues, to be used for works extension, storage, etc. It consists of main manufacturing building, engine house and other structures, about 60,000 sq. ft. in all.

The Brown Carburetor Corporation, New York, has been incorporated with a capital of \$125,000 by O. E. Edwards, 226 Seventy-sixth Street, and J. Bregman, 1009 Eastern Parkway, Brooklyn, and G. D. Wardrop, Mount Vernon, N. Y., to manufacture carburetors, etc.

Fire Jan. 31 destroyed the works of the American Aniline Products Corporation, Nyack, N. Y., with loss estimated at \$100,000.

The Sullivan Electric Co., Callicoon, N. Y., is planning an electric power plant at Delaware, N. Y. Application has been made to the Public Service Commission.

The Nassau Valve & Pump Corporation, Rockville Center, Long Island, N. Y., has increased its capital from \$20,000 to \$50,000.

The Mohawk Metal Toy Co., New York, has been incorporated with a capital of \$40,000 by E. Kessler, S. Hoffman and M. Wechsler, 25 St. Nicholas Avenue, New York, to manufacture metal novelties, dies, etc.

The Gordon Radiator Co., New York, has been incorporated with a capital of \$25,000 by A. P. Anderson, H. B. Gordon and J. Bramwell, 34 Nassau Street, to manufacture radiators, etc.

The National Lead Co., 111 Broadway, New York, has acquired a factory on Mendell Street, Chicago, formerly occupied by the Hirst & Begley Linseed Co., to be used for works extension.

The Cassidy Co., Brooklyn, has been incorporated with a capital of \$250,000 to manufacture gas and electric fixtures. G. W. Cassidy, Flushing, L. I.; Willard N. Baylis, Huntington, L. I.; and Albert Wahle, 1492 Bushwick Avenue, Brooklyn, are the incorporators.

Buffalo

BUFFALO, Feb. 3.

The Niagara Lockport & Ontario Power Co., Buffalo, has arranged for an immediate bond issue of \$1,980,000, out of a total issue of \$15,000,000, to be used in part for proposed extensions and improvements in electric plant and system, the latter extending from the Niagara River to Syracuse.

Louis C. Rogers, Inc., Rochester, N. Y., has been incorporated with a capital of \$25,000 by E. P. Milhofer, L. K. and L. C. Rogers to manufacture sheet metal specialties.

The Azadian Instrument Corporation, Syracuse, N. Y., has been incorporated with a capital of \$25,000 by H. B. Azadian, 130 West Colvin Street; K. R. Strandell, 103 Huron Street, and V. Metzger, 345 Baker Street, to manufacture instruments and operate a local machine works.

The Crucible Steel Co. of America, Syracuse, N. Y., is rebuilding two plant buildings on West Fayette Street. They are four-story and one-story, about 50 x 700 ft., and used for general manufacturing.

In connection with the removal of the plant of the Warsaw-Wilkinson Co., Warsaw, N. Y., to Batavia, the company is planning to use part of the plant of the Batavia Machine Co., Swan Street, an associated interest manufacturing agricultural equipment. The department will be equipped for the manufacture of ensilage cutters, in which the Warsaw-Wilkinson Co. specializes. W. S. Gouinlock is president.

The House Engineering Corporation, Buffalo, N. Y., has been incorporated with a capital of \$100,000 by A. and B. D. Shultz, 337 Brockbridge Street, and F. R. Gibson, 73 Manchester Place, to manufacture shock absorbers for automobiles and airplane parts.

The Buffalo Slag Co., Ellicott Square Building, Buffalo, will commence the erection of a new one-story crusher plant, 45 x 66 ft., on the Hamburg Turnpike to cost \$20,000.

The World Orthopedical & Surgical Mfg. Co., Buffalo, has been incorporated with a capital of \$500,000 by A. Pecorella and V. Patricolo, 359 Front Avenue, Buffalo, and F. H. Apel, Athol Springs, N. Y., to manufacture surgical instruments, etc.

The Atlas Crucible Steel Co., Dunkirk, N. Y., is planning the erection of two additions to consist of a one-story hammer shop, 70 x 130 ft., and general mill building, 50 x 70 ft.

The Niagara Iron & Metal Co., Niagara Falls, N. Y., has been incorporated with a capital of \$40,000 by F. and D. Diamond and W. S. Smith to manufacture metal products.

The Batavia Steel Products Corporation, Batavia, N. Y., is reported planning the sale of its plant, devoted during the war to the manufacture of 75-mm. shells. It comprises machinery and equipment, with total capacity of about 5000 shells daily. It has been giving employment to about 900 persons and was closed down a few weeks ago.

The Automatic Registering Machine Co., 163 Jones Street, Jamestown, N. Y., is building two additions to its plant for increased capacity, to consist of a four-story extension, 40 x 42 ft., and two-story addition, 30 x 58 ft.

J. J. Carrick, Inc., Clyde Avenue, Buffalo, is reported arranging for the sale of its machine shop on Clyde Avenue, fronting on the Lackawanna Railroad, heretofore devoted to the manufacture of 155-mm. steel shells. The property comprises about 7½ acres, with building, 80 x 300 ft., with two additions, 88 x 304 ft. and 30 x 200 ft. and complete machine tool installation.

New England

BOSTON, Feb. 3.

Oscar Katwick, Railroad Avenue, Bridgeport, Conn., will build a factory extension, two stories, 28 x 90 ft., to cost \$3,000.

The city of Fall River, Mass., has now in hand preliminary negotiations leading to a new pumping station and dam involving \$150,000.

The Acme Cone Co., Bridgeport, Conn., has plans completed for a two-story addition, 26 x 28 ft.

The Remington Arms Union Metallic Cartridge Co., Bridgeport, Conn., will equip a one-story boiler and mixing house, 36 x 54 ft., to cost \$5,100.

Drawings are in hand for a laboratory and boiler room for the city of Worcester, Mass.

Repairs, \$7,000, have begun on the factory damaged by fire in South Boston, Mass., of the United States Fastener Co., Boston.

Reconstruction has started on the hydroelectric plant of the Hamilton Mfg. Co., Lowell, Mass.

The United States Color & Chemical Co., Boston, has prepared plans for a research building, three stories, 84 x 44 ft., at Ashland, Mass.

General contract, \$122,906, has been let for the new machine shop for the Navy Department at Portsmouth, N. H.

The waterworks department, Hartford, Conn., has plans for a \$400,000 filtration plant.

The Hood Rubber Co. will build a one-story factory addition, to cost \$12,000, at Watertown, Mass.

Contract is still to be let for a set of three vertical water-tube boilers, 1000-hp., for a power house for the Walk-Over Shoe Co., Brockton, Mass.

Plans are in preparation for a \$6,000,000 ship-repairing plant at Jeffries Point, East Boston, Mass., for the Boston Dry Dock & Shipbuilding Co.

Work is progressing on the new manufacturing plant, \$300,000, for the Griffin Wheel Co., Chelsea, Mass.

The Aykroyd Iron Works, 31 North Foster Street, Worcester, Mass., has been incorporated with a capital of \$20,000 to take over the business of the same name for the manufacture of iron products. T. Edward Aykroyd is president and Albert Aykroyd treasurer.

The Ames Plow Co., Framingham, Mass., has arranged for a dissolution of its business and the sale of its local plant, including the Framingham Foundries. The main structure is one story, of brick and steel, 202 x 320 ft.

The Scovill Mfg. Co., Waterbury, Conn., has made application to increase its capital from \$5,000,000 to \$15,000,000.

The Shipping Board, Washington, is considering the erection of a naval repair plant at South Boston, Mass., on a site recently purchased from the State. It is proposed to establish works for the handling of Government

and merchant vessels, with a number of shop buildings. Bids are now being taken for the erection of a one-story building, 83 x 314 ft., at the Boston Navy Yard.

Philadelphia

PHILADELPHIA, Feb. 3.

The Peters Engineering Co., 3202 Chestnut Street, Philadelphia, is taking bids for a new one-story shop, 42 x 127 ft., at Thirty-third Street and Woodland Avenue.

The Barrett Adding Machine Co., Bulletin Building, Philadelphia, has leased two floors at 1208-16 Race Street, providing about 18,000 sq. ft. of floor space for increased operations.

The foundry buildings at the former plant of the Wharton Switch Works, Twenty-fifth Street and Washington Avenue, Philadelphia, on a site 117 x 142 ft., have been sold by William Wharton, Jr., & Co. to Charles A. Shetzline for about \$13,500.

The Chester Shipbuilding Corporation, Chester, Pa., is planning the erection of a two-story shop, 37 x 120 ft., to cost \$25,000.

The Board of Trustees, Pennsylvania State College, State College, Pa., is planning the erection of a new power plant to cost about \$150,000.

The Logan Works, Burnham, Pa., manufacturer of iron and steel products, has resumed operations following a shutdown due to a strike last month. The normal working force is about 650.

Fire Jan. 21 destroyed the four-story planing mill of the Fitzgerald-Speer Co., Pen Argyl, Pa., with loss including machinery, estimated at over \$400,000.

The Public Service Commission, Harrisburg, Pa., has granted permission to the following electric power companies to issue securities in part for extensions and improvements: Penn Central Light & Power Co., Altoona, \$70,000, bonds; Harrisburg Light & Power Co., \$215,000 in notes, and \$35,000 bonds; Eastern Pennsylvania Railway Co., Pottsville, \$11,000 bonds.

During the last week in January the Kutztown Foundry & Machine Co., Kutztown, Pa., made the largest shipment in the history of the plant, loading and forwarding six cars of coke-oven machinery for Detroit.

The machine shop at the North Wales Machine Co., North Wales, Pa., which was destroyed by fire Jan. 21 with estimated loss, including machinery, of about \$25,000, will probably be rebuilt.

Plans are being considered for a new hydroelectric power plant by the Welewood Silk Mills, Hawley, Pa., to work operation.

Fire Jan. 21 destroyed a portion of the works of the Temple Malleable Iron Co., Temple, Pa., with loss estimated at \$75,000. The company carried insurance on the plant aggregating \$100,000 and it is understood that the structure will be rebuilt.

Baltimore

BALTIMORE, Feb. 3.

The General Elevator Co., East Saratoga Street, Baltimore, has acquired property at 107 South Eighth Street and it is proposed to equip the extension for the manufacture of elevators.

A two-story air compressor works, 38 x 55 ft., will be erected by the Standard Distilling & Distributing Co., Baltimore, at its plant at Eleventh and O'Donnell streets.

The Brinser Handle Works, Richmond, Va., is planning for the erection of an extension to its plant to cost about \$10,000. A boiler and engine plant will be established in connection with the new building.

The Bureau of Yards and Docks, Washington, has had plans prepared for a new galvanizing works at Norfolk, Va., to cost about \$100,000.

The Southern Truck & Car Corporation, Greenville, N. C., is said to be planning for the erection of a new plant. J. A. Norford is president.

The Steel Castings Corporation, Altavista, Va., has been incorporated with \$50,000 capital stock. P. F. Hardison is secretary.

The Old Virginia Orchard Co., Front Royal, Va., wants prices on 20-hp. motors for cold storage equipment.

The Southern Stove Works, Richmond, Va., has been organized with \$400,000 capital. E. J. Burke is secretary.

W. A. Carver, Rougemont, N. C., wants prices on 50-60-hp. generators and motors up to 25 hp.

Prices on second-hand Corliss engines are sought by the Summerfield Milling Co., Summerfield, N. C.

The Lummus Machinery Co., Spartanburg, S. C., plans

to erect three buildings and install equipment for the manufacture of cotton-gin machinery and specialties.

J. S. Vinson, Rembert, S. C., wants prices on 20-hp. kerosene engines.

The Murray Co. is understood to be planning the construction of a plant at Atlanta, Ga., for the manufacture of gray-iron castings for cotton-gin and oil-mill machinery. N. B. Henry, Atlanta, is in charge.

The Hattey Machinery Co., Rome, Ga., is in the market for second-hand lathes and drill presses.

Jeffers Brothers, Montgomery, Ala., are seeking prices on gasoline or electric hoisting machinery.

A portion of the main building of the Cuthbert Oil Mill Co., Cuthbert, Ga., which was destroyed by fire recently, with loss estimated at \$25,000, it is understood will probably be immediately rebuilt.

George Waldhauser, 1036 Rutland Avenue, Baltimore, will install 10-hp. in boilers.

Pittsburgh

PITTSBURGH, Feb. 3.

The S. R. Dresser Mfg. Co., Bradford, Pa., is inquiring for a double-end power punch with an 18 to 24 in. gap and with a capacity for cutting a 1-in. hole in a 1-in. plate.

The E. T. Lippert Saw Co., Lincoln Avenue, Millvale, Pa., manufacturer of metal cutting saws, etc., has resumed operations at its plant on a pre-war basis.

The R. Gracey & Sons Co., First Avenue, Pittsburgh, manufacturer of iron and steel forgings, has purchased property in the vicinity of its works on Second Avenue for proposed extensions.

Following the resumption of manufacture at its works, the Westinghouse Electric & Mfg. Co., East Pittsburgh, is now operating on an overtime schedule to allow for the immediate production of a number of its specialties for former orders. It is said that the company has contracts on hand to insure the operation of the works at maximum output for many months to come. The plant is now giving employment to upward of 15,000 persons. The shops, which have been engaged in the manufacture of shells, have been closed down, to allow for changes in machinery, equipment, etc. Former employees at the shell plants are being used at the main electric works. During the entire war period the company produced about 6,000,000 shells, production at one time averaging close to 20 cars a day; the plants also manufactured about 8,000,000 rifle grenades and 500,000 grenade discharges.

Williams & Co., 220 Penn Avenue, Pittsburgh, manufacturers of seamless steel tubing, are reported developing a convertible boring machine and are said to be arranging to place it on the general market at an early date.

The Erie Electric Motor Co., Erie, Pa., has been granted permission by the State Public Service Commission to issue bonds for \$250,000.

The Baltimore & Ohio Railroad, Baltimore, Md., is planning the erection of a new machine shop at Grafton, W. Va.

The Guyan Machine Works, Logan, W. Va., will receive bids for supplying $\frac{1}{2}$ -in. to $1\frac{1}{2}$ -in. bolt cutters, 10 to 25-hp. electric hoists, milling machines, channel irons, angles and shafting.

Chicago

CHICAGO, Feb. 3.

January proved a fair month with the machine-tool trade in the volume of business done. Although there was but one list of considerable size, that of the Chicago & Alton Railroad, the volume of small inquiries and sales attained satisfactory proportions. Prospects in the Northwest appear to be good, the tractor industry everywhere is most active, and in the vicinity of Chicago a decided betterment in the rate of operations of brass goods manufacturers is shown. Another notable feature is that some customers whom dealers have seen but little since the United States entered the war have lately come into the market, an evidence that they are preparing to go ahead on normal lines. The Chicago automobile show, held the past week, has also been a factor in promoting business, several inquiries and sales having been traced to show visitors.

Dealers are well stocked—in fact, better than they have been in several years, tool builders having shipped freely to them in recent weeks against stock orders which were long dormant. The indications are that most of the sales in the near future will be made against these stocks, and that dealers will make fewer shipments direct to purchasers. From several directions come reports of slowed-down operations on the part of tool manufacturers, and one Western company which was threatened with labor trouble shut down entirely.

Munitions and war contractors, who have a surplus of tools on their hands, are offering machines freely to dealers.

though in some cases it is believed their main idea at the moment is to get an offer on which to base valuations which will assist them in settlements with the Government. Fair progress is being made in the settlement of claims, although but few payments have been made so far. Some in the trade who believed that fully six months would be required to reach definite settlements are now of the opinion that the desired results will be attained more expeditiously, partly because civilian employees of the Government, who are giving their attention to adjusting claims, are most anxious to return to their regular pursuits. In a few cases used machines in excellent condition have been sold at low prices, the basis being their 1914 value.

Several tool builders have made concessions in prices to obtain orders. Buyers quite generally ask to be secured against declines which may come in the next six months, especially where fairly large sums are involved, and several builders are agreeing to such a clause in their bills of sale.

Various Government departments, such as the Bureau of Aircraft Production and Ordnance Department, have a large number of men now engaged in this district striving to arrive at valuations of materials of many kinds, so that the Government may be properly credited where a contractor retains material originally bought for war purposes, while it also is sought to reach an equitable basis on which this material may be sold, should the contractor not retain it. Last week about 400 contractors attended a meeting in the offices of E. A. Russell, chairman of the Chicago District Claims Board. At that time Mr. Russell urged the necessity of speed in presenting claims. Some delay had resulted through uncertainty as to how claim blanks should be filled out and this trouble was corrected.

The Krasberg Mfg. Co., tool and die maker, 536 Lake Shore Drive, Chicago, which was heavily engaged on war work and now has a large department for the manufacture of phonograph parts, has purchased a site, 100 x 192 ft., on the south side of Ohio Street near the Lake Shore Drive, on which it will build a factory at a cost of at least \$200,000. Plans have not yet been announced, but it is understood that a seven-story building will be erected.

The Variety Mfg. Co., maker of iron doors, has purchased five acres at Twelfth Street and Fifty-sixth Avenue, Chicago, and eventually a new factory will be built, although no plans have yet been prepared.

The Peerless Light Co., 813 West Adams Street, Chicago, will have alterations made at a cost of \$25,000 to a six-story factory, 100 x 200 ft., at Washington Boulevard and Union Avenue.

Anton Charvat, architect, 2621 Millard Avenue, Chicago, is taking bids on a three-story manufacturing building, 125 x 150 ft., to be built at Jefferson and Monroe streets, for prospective tenants.

Frank D. Chase, industrial engineer, Peoples' Gas Building, Chicago, is taking bids on the plant designed for the Conlon Electric Washer Co., at a cost of about \$200,000, previously reported.

It is reported that the Western Cartridge Co., Alton, Ill., plans to build a brass mill and devote a portion of its plant to the production of brass novelties.

The Overland Tire & Rubber Co., Omaha, Neb., has taken bids for the construction of a new two-story plant, 60 x 300 ft., at Thirtieth and Taylor streets, to cost about \$125,000.

The Advance-Rumely Thresher Co., West Ninth Street, Des Moines, Iowa, will build an addition to its plant to cost over \$100,000.

Milwaukee

MILWAUKEE, Feb. 3.

The volume of business, while still limited, is showing some expansion from week to week. New orders received by local manufacturers are strictly of a hand-to-mouth character, and beyond supplying immediate needs there is as yet no tendency toward placing liberal requirements. Export demand, which has been showing some signs of life, continues in a hesitant, halting manner, but from the inquiries that are being received gives promise of developing into volume. Domestic orders come from a variety of sources, with the automotive industry still leading as a buyer.

Charles H. Besly & Co., Chicago, manufacturer of disc grinders and ring wheel grinding machines, is making preliminary arrangements for extensions of its main works at Beloit, Wis., by the purchase of 66 ft. of land adjacent to the plant.

The Cream City Boiler Co., Milwaukee, has increased its capital stock from \$50,000 to \$75,000 to accommodate the growth of its production and business.

The Hayton Pump & Blower Co., Appleton, Wis., has been incorporated with a capital stock of \$50,000 to manufacture centrifugal pumps, blower systems and similar industrial appliances. It has acquired the foundry and

machine shop of the former Killen-Straut Tractor Co., Appleton, and expects to have completed alterations so that operations may begin the present week. T. R. Hayton, an experienced pumping engine designer and engineer, is president and general manager. E. D. Rasmussen, for 20 years connected with the pumping engine department of the Allis-Chalmers Mfg. Co., is secretary and general superintendent.

The Clintonville Power Co., Clintonville, Wis., which some time ago completed a \$150,000 hydroelectric installation on the Embarrass River, has been acquired by interests said to be identified with the Kelsey-Brewer syndicate of Grand Rapids, Mich. The name of the corporation has been changed to Central Wisconsin Power Co. The new owners are preparing to invest from \$1,000,000 to \$2,000,000 in the enlargement of the plant and the improvement of other water power sites on the Embarrass River. The officers are: President, F. H. Josslyn, Oshkosh, Wis.; secretary and treasurer, C. A. Runyan, South Haven, Mich.

The Allis-Chalmers Mfg. Co., Milwaukee, which is enlarging its main works at West Allis to accommodate the tractor production department, is contemplating the extension of the initial building, which will be 110 x 320 ft., three stories. Practically all of the machinery and equipment has been purchased.

The Madison-Kipp Co., Madison, Wis., manufacturer of force-feed lubricating devices, has acquired a 15-acre site in Waubesa, where it intends to relocate its works as soon as convenient. Tentative plans call for a one-story brick, steel and concrete machine shop, 150 x 200 ft., with saw-tooth roof. It is hoped to begin work in the spring, but arrangements have not assumed definite shape. Thomas E. Coleman is vice-president and general manager.

The Oneida Motor Truck Co., Green Bay, Wis., has increased its capital stock from \$300,000 to \$600,000 and will use the additional issue to finance enlargement of the plant and equipment and provide for an increased output of motor trucks. Lafayette Markle, formerly head of the Republic Truck Co., Alma, Mich., is president and general manager.

The Badger Meter Mfg. Co., 261-265 Third Street, Milwaukee, manufacturer of water meters, has increased its capital stock from \$35,000 to \$50,000. It has acquired the former plant of the Christensen Engineering Co. at Thirtieth Street and Meinecke Avenue, and will commence operations in the new quarters some time this week. A brass and aluminum foundry will be added after March 1. J. J. Leach is president and general manager.

Otto F. Ewert, 1227 Twenty-fourth Street, Milwaukee, who has been general superintendent of the Wisconsin Gun Co., a Government ordnance plant, since its establishment, is organizing a corporation to manufacture a new type of aircraft propeller constructed entirely of chrome vanadium steel which he has designed and perfected. Mr. Ewert expects to establish a plant, but has not completed details.

The Sterling Fixture Co., Milwaukee, which was incorporated early in January to manufacture gas and electric fixtures and appliances, has changed its name to the Moe-Bridges Co. The capital stock is \$25,000. It plans also to undertake general electrical contracting and engineering work. Henrik Moe is president.

The Graef Wire & Mfg. Co., Menasha, Wis., manufacturing brass screens and other paper and pulp mill supplies, has awarded the general contract to the Appleton Construction Co., Appleton, Wis., for the erection of its new plant, to cost about \$60,000 with equipment. The main shop will be 110 x 150 ft., one story, of brick and mill construction, with a boiler house, 30 x 45 ft. E. E. Wettengel, Appleton, is architect. John Graef is general manager.

The Townsend Mfg. Co., Janesville, Wis., has engaged W. H. Blair, architect, Janesville, to prepare plans for a machine shop addition costing about \$20,000. It manufactures gas and kerosene engines and farm tractors and recently increased its capital stock from \$125,000 to \$175,000.

The Trenam Tractor Co., Stevens Point, Wis., which acquired the foundry and machine shop and business of the Central City Iron Works a year ago, and has since devoted most of its attention to the manufacture of castings, will engage in a regular production of farm tractors at once. Materials and parts for 1000 machines have been contracted for to cover 1919 requirements. The commercial foundry business will be continued. J. J. Trenam is president and chief engineer.

The Molle Typewriter Co., Oshkosh, Wis., will enlarge its output and is purchasing some additional automatic machinery and other machine tools. The third floor of the building occupied by the company has been leased to

provide needed space. R. D. Wynn is president and manager.

E. C. Plank, Plymouth, Wis., has leased the Holzschuh building and is equipping part of it for the manufacture of milk can covers, power pulleys for meat choppers and similar specialties.

The Kaukauna Machine Co., Kaukauna, Wis., manufacturer of power hammers and other machine shop specialties, is executing an export order for nine hammers to be shipped to Kobe, Japan, and another for two hammers for a firm in Paris.

The Badger State Tanning Co., Sheboygan, Wis., has plans for a new machine shop and boiler house, 70 x 95 ft., of reinforced concrete and brick, costing about \$25,000. The architects are Juul & Smith, Sheboygan.

The Winther Motor Truck Co., Kenosha, Wis., began work Jan. 28 on the removal of its main works and offices from Winthrop Harbor, Ill., to the new plant erected and equipped at a cost of \$125,000 in North Kenosha. Production will be resumed about Feb. 5 in the new quarters.

The Common Council, West Allis, has engaged Arthur J. Sweet, consulting engineer, 521 Grand Avenue, Milwaukee, to prepare tentative plans and estimates of a proposed municipal electric light and power plant.

The National Machine Co., Milwaukee, is in the market for a 24-in. x 14-ft. lathe and possibly a planer.

Detroit

DETROIT, Feb. 3.

Local industrial and business leaders in a special conference last week, declared that the peak of the unemployment situation in Detroit had been reached with the closing of the plant of the American Car & Foundry Co. for three months throwing 5000 men out of work and bringing the total of unemployed up to about 40,000. A thorough discussion of the situation, however, resulted in the unanimous opinion that industries in this district were beginning to increase their manufacture and that within a short time conditions would be better than ever. Automobile accessories companies reported definite orders on their books, the largest in their history, being held up, due to the failure of the Government to settle war contracts and their inability to secure raw material.

Many manufacturers are taking advantage of the slack time and surplus labor for alteration to their plants, and as the result machine tool jobbers report a slight quickening of the market.

The factory formerly occupied by the Michigan Desk Co., Grand Rapids, Mich., has been purchased by the John D. Raab Furniture & Chair Co. It will be connected with the Raab factory.

The Grand Rapids Brass Co., Grand Rapids, Mich., manufacturers of drawer handles, desk supports, and other articles of hardware contemplates the erection of a larger factory than it now occupies. It has discontinued its manufacturing at Belding.

The Foundation Co., Port Huron, Mich., is making ready for the construction of one of the largest drydocks on the Great Lakes. It will be 659 ft. long and will have sufficient depth and breadth to accommodate the largest boats. A wharf 1100 ft. long is now under construction.

The factory formerly occupied by the Swiss Magnet Co., Monroe, Mich., has been purchased by the Brisk Blast Co. of that city, manufacturer of pumps for automobile tires. It will soon begin the erection of a new foundry.

The Brunswick-Balke-Collender Co., Muskegon, Mich., will erect an addition to its plant to cost \$200,000, to be used in the production of rubber goods manufactured from left-over materials in tire making. This new department will necessitate the employment of about 500 more men.

The Central Foundry Co., an adjunct of the General Motors Corporation, Saginaw, Mich., will erect a new foundry to cost \$550,000. It will be of concrete, iron and brick and will furnish much of the iron work for the new motor industry which the General Motors Corporation will install in the plant recently utilized by the Peninsular Shell Co. in Government work. Work will be pushed rapidly and it is expected to have the plant in operation about Aug. 1.

The General Motors Corporation is reported to have completed plans for the erection of a \$1,500,000 plant in Detroit for the Scripps-Booth Motors Corporation. Announcement of the site of the plant has not been made, although it is believed that the tract recently secured by the General Motors Corporation in the northern part of the city will be used.

At the annual meeting of the American Commercial Car Co., Detroit, the following officers and directors were elected: President and general manager, H. C. Wideman; vice-president, Fred Kahl; secretary, George P. Good; treasurer, H. A.

into directors. Henry C. Wideman, George P. Good, Adam Klein, H. L. Goldman, Anthony J. Nowe, Joseph A. Miotke, Fred Kuhl, Gustav A. Mueller, Harry A. Otto, Julius C. Hintz, Alexander Lemke, August J. Stieber.

The McIntyre Motor Co., Kalamazoo, Mich., has elected the following officers and directors: President, W. H. McIntyre; vice-president, Dr. A. S. Youngs; second vice-president, C. H. Gauntlett; secretary-treasurer, Dr. Frank W. Holmes. The officers with Carl Hoffman, A. J. Patterson and E. D. Core comprise the board of directors.

The Michigan City Foundry & Machine Co., Michigan City, Ind., is being organized for making gray and semi-steel casting. Incorporation has been granted and ground will be broken in April for a plant. The company is in the market for cranes, yard, foundry, cupola, and other equipment. Albert F. Port, former secretary of the Nichol-Straight Foundry Co., Chicago, is organizing the company. It will cater to users of castings who in the past have been unable to get the kind needed for their requirements. A chemist will be employed who will devote his entire time for the benefit of the trade.

Morgan & Wright, foot of Bellevue Street, Detroit, manufacturers of rubber goods, are planning for the erection of a seven-story and basement addition, 140 x 170 ft., to cost about \$500,000.

Cincinnati

CINCINNATI, Feb. 3.

There is a steady demand for boring mills from automobile manufacturers and as a consequence makers are very busy and have enough work ahead to keep operating for the next three or four months. Very few cancellations have been made by the Navy Department, and machine-tool builders having contracts with that department are pushing work in hand as fast as possible. Manufacturers of engineering specialties are also busy on naval work.

The question of ocean freight rates is being agitated by the export department of the Cincinnati Chamber of Commerce. Unless some concessions are made the delivered cost of heavy machinery in Europe will be almost prohibitive. This matter has time and again been called to the attention of machinery manufacturers on this side and the general belief is that some relief will be obtained through efforts of shippers on this side and their representatives in Europe.

A number of quiet inquiries for both machine tools and portable electric drilling and grinding machines have lately been received from Spain. The recent visit of a Belgian buyer of machinery confirms rumors that there will be a large number of machine tools needed in Belgium and it is expected that America will furnish the larger part.

The Corcoran Fender & Tool Box Co., Norwood, Ohio, has been incorporated with a nominal capital stock of \$1,000 to manufacture automobile specialties. E. B. Corcoran is one of the principal incorporators.

The Henley Planing Mill Co., Hamilton, Ohio, will build an addition to its plant at an early date.

The Huenefeld Co., Cincinnati, has increased its capital stock from \$10,000 to \$50,000. It manufactures sheet metal specialties and has recently completed an addition to its plant on Spring Grove Avenue.

The Vitrocell Co., Columbus, Ohio, organized about six months ago to manufacture non-shatterable glass for gas masks, is making arrangements to manufacture industrial goggles for machine shops and factories. Practically all the necessary equipment has been installed.

The Climax Rubber Co., recently incorporated, will locate a plant for making inner tubes for automobiles at Greenville, Ohio.

The Troy Body Co., Troy, Ohio, has been incorporated with \$100,000 capital stock by C. C. Cross and others. It will manufacture automobile bodies, and has leased part of the plant of the Troy Mfg. Co.

The Chillicothe Tire & Rubber Co., Chillicothe, Ohio, recently organized, is making arrangements to equip a plant for the manufacture of automobile tires.

Elmer Collins, Portsmouth, Ohio, is interested in a new company organized to make automobile tires.

The Quality Tire & Rubber Co., Anderson, Ind., has let contracts for an addition to its plant.

The Laurel Motors Corporation, Anderson, Ind., is ordering machinery sufficient to nearly double its present capacity.

The B. I. Mfg. Co., Anderson, Ind., manufacturer of automobile trailers, will enlarge its plant at an early date.

The Martin Steel Products Co., Mansfield, Ohio, has been incorporated to take over the partnership of C. E. Martin & Brothers and the National Steel Products Co., the latter

a jobbing concern. The company is engaged in the manufacture of galvanized steel articles, such as steel garages, culverts, etc., and will increase the capacity of its plant at an early date.

Cleveland

CLEVELAND, Feb. 3.

A great deal of second-hand machinery is being placed on the market by Government contractors. This is particularly true in Detroit, where a round lot of machine tools for airplane and other Government work are coming out, much of which is being sold direct without going through the hands of dealers. One lot amounting to about \$40,000 is reported to have been sold by the Cadillac Motor Car Co. to the Northway Motor & Mfg. Co. In Dayton, Ohio, Government contractors are also offering some round lots, including 40 milling machines. Three Canadian companies are trying to dispose of 150 turret lathes and screw machines, having offered them to the builder, but at prices that were not attractive. With new demand at a low ebb, the effect of offerings of large quantities of used machines is felt by machine tool builders.

There is a good volume of small inquiry for from one to three machines, but in most cases second-hand machinery is being asked for. The General Motors Corporation has purchased a round lot of machine tools for its Chevrolet plant in Toledo. Some activity has recently sprung from local manufacturers of plumbers' brass goods, who placed orders the past week for a number of screw machines and turret lathes.

The Morgan Engineering Co., Alliance, Ohio, is operating its ordnance plant at about 50 per cent of capacity, at which it was run before the armistice was declared. The company has uncanceled orders for gun mounts which are expected to keep the works in operation about six months.

The Hardwick Mfg. Co., Toledo, Ohio, has established a plant, which includes a foundry, at Tenth and Adams streets for the manufacture of gas and oil heating equipment. Stanley Hardwick and James A. Wood are interested in the company, which has a capital stock of \$75,000.

John N. Willys, president Willys-Overland Co., Toledo, has acquired a 300 acre site near the Willys-Overland plant which he plans to use for the erection of assembling and other buildings, and to provide factory sites for other industries that desire to locate there.

The Allerding Products Co., Mansfield, Ohio, recently incorporated with a capital of \$50,000, is reported to be in the market for wood and metal-working machinery.

The Dine-Deweese Co., Canton, Ohio, maker of automobile accessories, has increased its capital stock from \$100,000 to \$200,000, to take care of business expansion.

The Seneca Wire & Mfg. Co., Fostoria, Ohio, contemplates an extension to its plant and the installation of additional equipment.

The Beach Enameling Co., Coshocton, Ohio, has placed a contract for the erection of a one-story addition 77 x 115 ft., of brick, steel and concrete. It manufactures enameled advertising signs.

The National Steel Barrel Co., 3560 East Ninety-first Street, Cleveland, plans the erection of an addition, 110 x 121 ft.

The Globe Machine & Stamping Co., Cleveland, has awarded a contract for the erection of a two-story addition, 60 x 136 ft.

The Central South

LOUISVILLE, Feb. 3.

The Earlington Machine Co., Earlington, Ky., capital \$10,000, has been incorporated by Amelia, John and C. A. Hanna.

The Union Machine Co., Louisville, capital \$15,000, has been incorporated by Harry and Ray Buckley and M. L. Kannapell to manufacture milling machinery and electrical devices and conduct a brass foundry.

James Love, manager Love Foundry Co., Winchester, Ky., announced Jan. 31 that his plant would close indefinitely, due to shortage of casting orders and the uncertainty of the market.

The American Minerals Co., Hopkinsville, Ky., is in the market for a small upright 20-hp. steam boiler.

It is reported that the Lack Mfg. Co., Paducah, Ky., will install machinery costing \$10,000 to manufacture rotary valve engines of the internal combustion type.

E. L. Douglas, Staub, Ky., manager for the J. B. Elkhorn Coal Co., is in the market for a 7-ft. electrically driven mine fan.

The Appalachian Marble Co., Knoxville, Tenn., is in the market for a 150-hp., 150-lb. pressure boiler and steel stack.

The East Laurel Mining Co., Nashville, Tenn., recently organized with a capital of \$50,000, is planning to install tipple apparatus, hoists, air compressor plant and air-operated tools, mining cars and other equipment at its coal properties. John P. Williams, Jr., is president.

The Automotives Corporation, Nashville, Tenn., has been incorporated with a capital of \$10,000 to manufacture engines and similar products. W. L. McFarland, Henry E. Neel, Jr., and G. F. Tenison are the incorporators.

The Board of County Commissioners, Memphis, Tenn., is considering the installation of a new electric-lighting plant in the local courthouse to cost about \$10,000.

The Thornton Trolley Wheel Co., Ashland, Ky., has been organized to manufacture iron wheels for trolley service and other products. P. M. Scott is president.

Indianapolis

INDIANAPOLIS, Feb. 3.

The Schmoe Furniture Co.'s plant, Shelbyville, Ind., has been sold by Charles F. Schmoe to a Detroit company, headed by L. A. Young, with a capital of \$250,000.

The Hamilton, Ont., branch of the Oliver Chilled Plow Works, South Bend, Ind., has been sold to the International Harvester Co.

The city of Richmond, Ind., is planning to re-equip the municipal light and power plant at a cost of \$250,000.

The Mutual Truck Co., Sullivan, Ind., has bought 10 acres at the intersection of the Chicago & Eastern Illinois and the Illinois Central railroads as a site for a plant.

St. Louis

ST. LOUIS, Feb. 3.

T. L. L. Temple, Texarkana, Ark., will erect plants for pressing cotton oil and for the manufacture of fertilizer.

The Galloway General Electric Co., Little Rock, Ark., has been incorporated with a capital stock of \$50,000 by W. P. Galloway, M. R. Galloway and A. L. Howland to equip and operate electric light and power plants.

J. F. Kern, Butler, Mo., will erect an electric light and power plant and is in the market for the machinery.

The board of managers of the State Hospital, Fulton, Mo., will equip a power plant and expend about \$27,000 for machinery, etc.

The R. E. Johnson Fertilizer Co., Gulfport, Miss., is reported in the market for about \$5,000 worth of machinery.

The Liberty Oil & Carbon Co., Inola, Okla., will equip an oil refinery involving an investment of \$250,000.

The Temple Machine & Tool Co., Temple, Okla., has been incorporated by George T. Juhns, Harry W. Peters and others to manufacture machinery.

The Tulsa Boiler & Sheet Iron Works, Tulsa, Okla., will add about \$8,000 worth of new equipment to its plant.

The Manning-Blei Lumber Co., Little Rock, Ark., G. B. Blei, T. Manning and others interested, is reported in the market for about \$25,000 worth of machinery and general mill equipment.

The city of Pascagoula, Miss., will equip loading docks and is in the market for considerable mechanical loading and unloading machinery.

The St. Louis-San Francisco Railway, headquarters St. Louis, the chief engineer in charge, will increase the roundhouse and machine shop capacity of the terminal at Kansas City, Mo.

Fire Jan. 26 destroyed the plant of the Southern Cotton Oil Co., Gretna, La., including repair works, to the extent of about \$45,000. The loss in machinery and equipment is estimated at over \$25,000.

The Mobile Shipbuilding Co., Mobile, Ala., a Delaware corporation, has increased its capital from \$1,000,000 to \$5,000,000.

Texas

AUSTIN, Feb. 1.

The Wyatt Metal & Boiler Works, Dallas, has increased its capital stock from \$100,000 to \$200,000, and will enlarge its plant. A site, 150 x 500 ft., has been acquired for extensions.

The American Trailer & Body Co., Houston, has purchased a site for its proposed plant for the manufacture of motor trucks, bodies and trailers. J. H. Fleming is president.

The Lone Star Truck & Tractor Co., San Antonio, will construct a plant for the manufacture of motor trucks and

tractors, the first unit to consist of a one-story brick and concrete building, 80 x 464 ft. Other buildings will be added as the demands of the business may require. J. C. Deppmann, San Antonio, has been awarded the contract.

The Panther City Oil & Refining Co., Fort Worth, has purchased a site upon which it will construct an oil refinery with a daily capacity of 10,000 bbl. W. B. Townsend, Fort Worth, is president.

W. J. Walder, Mineral Wells, and associates are promoting the construction of an interurban electric railroad between Fort Worth and Mineral Wells, a distance of about 6 miles. The project involves the installation of an electric power plant.

The Sammies Oil Corporation, Fort Worth, has adopted plans for the construction of an oil refinery to cost along \$1,000,000. It has extensive oil land holdings in the central west Texas fields.

The Cisco Gas & Electric Co., Cisco, will enlarge its electric light plant. New machinery will be installed.

The Dallas Motor Car Co., Dallas, is said to be planning for the rebuilding of its plant, recently destroyed by fire.

The Blumberg Motor Mfg. Co., San Antonio, has increased its capital from \$50,000 to \$100,000.

The Industrial Transportation Co. will construct a packing plant and warehouse at Houston to cost \$1,000,000 to \$1,500,000. The proposed plant will have a daily capacity of 1,000 beeves, 1,000 hogs and 500 sheep, it is stated. The building will be four stories of concrete and steel construction, exclusive of the basement, in which the refrigerating plant will be installed.

Preparations are being made to begin the construction of a 3,000-barrel oil refinery at Wichita Falls by the Texas Gulf and Pipe Line Co. The company has a capital stock of \$500,000.

The Bradford Oil Well Supply Co. will establish a large oil well supply house at Wichita Falls. Van Wormer of Chanute, Kan., will be manager of the new branch.

The P. E. Magee Natural Gas Syndicate of Tulsa, Okla., will lay a natural gas pipe line from two wells that it owns to Brownwood for the purpose of supplying the fuel for industrial purposes.

The United States Government, through Secretary of Navy Daniels, has signed a contract with the Lone Star Gas Co. of Fort Worth by which the natural gas which the company now obtains from the Petrolia field is to be used by the Government for the extracting of a non-inflammable balloon gas, known as Helium. The contract also provides for the laying of a new trunk natural gas pipe line from other West Texas fields to Fort Worth and Dallas, with branches to a number of smaller towns, all involving an expenditure of approximately \$4,000,000.

The Wyatt Metal & Boiler Works, Dallas, Tex., manufacturers of boilers and kindred products, has increased its capital from \$100,000 to \$200,000.

The Pacific Northwest

PORTLAND, Jan. 28.

The order of the Federal Shipping Board for the suspension of work on all steel steamships of the 8800-ton and the 3500-ton class reached here Jan. 25. This means the throwing out of work 10,000 men by next July. Following closely upon the order canceling contracts for wooden steamships it is the heaviest blow the local industry has received. The closing or partial closing of these yards means a decided contraction of the amount of work going to machine shops and the possible shutdown of some of these. Vessels under construction which may be finished by July 1 are not affected by the order, but 25 steamers are involved with an aggregate value of \$38,000,000. Word from Tacoma tells of the canceled contracts for 12 ships there. No Seattle contracts have yet been canceled, but orders have been given asking for the preparation of a schedule showing the cost of canceling three of the last five contracts awarded the Dutchman yard.

A slight depression is felt in all lines of industry, which will undoubtedly increase to serious proportions if the shipyard strike in Seattle is prolonged. Coming in the reconstruction period, when a feeling of uncertainty pervades every industry, it is one of the most serious setbacks yet experienced.

The American Marine Iron Works, Portland, has let contracts for the immediate construction of a \$50,000 marine repair plant at St. Johns, adjoining the new municipal dry dock.

Whether the Foundation Co.'s wooden shipyard at Portland will be converted into a steel yard to take forest contracts has not yet been decided, according to one of the officials of the company. If the United States Government gives its permission the yard will at once be converted to

and steel ships, and pending contracts with France will be closed.

The Prince Rupert Shipbuilding & Engineering Co., Prince Rupert, B. C., has been organized with a capital of \$500,000 and has contracts to build nearly 100,000 tons of steel ships. J. L. Mullen, head of the Mullen Construction Co., Pittsburgh, is president.

The Pacific Construction & Engineering Co., 2917 East Marginal Way, Seattle, will erect an addition, 22 x 24 ft., to be used as a forge shop. Some new equipment will be installed.

The Astoria Marine Iron Works, Astoria, Ore., will probably be developed into a steel plant for the fabrication of marine and structural iron. Plans for the proposed 6000-ton marine railroad have been completed and approved. The company also contemplates enlarging its present buildings and increasing its ship repair facilities, and has purchased a site approximately four miles long on the water front for extensions. Thomas Bilyou is president.

The United States Spruce Production Corporation, Vancouver, Wash., will sell the equipment and machinery of its cut-up plant at the Government headquarters in Portland on Feb. 15. The plant represents an expenditure of \$10,000,000. Much of the machinery is new.

Plans have been completed by the Universal Nut Lock Co., Portland, Ore., to move its factory to Seattle, where new buildings will be erected in Block 11 of the Industrial Sites. The company is capitalized at \$500,000. E. L. Smith is president.

Plans have been prepared for rebuilding the plant of the Coast Carton Co., 4133 Stoneway Avenue, Seattle, recently damaged by fire. Repairs to the building will cost \$15,000. The loss to machinery and contents is estimated at \$50,000. Considerable new equipment will be required.

The Lake Union Foundry Co., Seattle, has been incorporated by W. A. Wadleigh, J. Robertson, et al., for \$6,000. Plans have not been announced.

E. B. Kingman, Columbus, Mont., and A. W. Miller, Napa-vine, Wash., announce the formation of a company with capital stock of \$800,000 for the erection of a sawmill in Eugene, Ont. The plant will have a daily capacity of 100,000 ft.

The Swedish-Finn Co., Marshfield, Ore., has been organized with a capital stock of \$75,000, and will establish a shipyard for building lumber schooners. It will run on a co-operative basis.

The Pacific Products Co., Seattle, has recently installed electric arc welding machines in its plant at 4806 Eighth Avenue South. Machinery for making studbolts and threading rods and bolts has also been installed.

Plans are being made for the reorganization of the Chehalis Furniture & Mfg. Co., Chehalis, Wash., for rebuilding its furniture factory destroyed by fire early last year. The company will have a capital stock of \$75,000.

The Norway Pacific Construction & Drydock Co., Everett, has received a contract, it is reported, for five coast guard cutters, at a total cost of \$3,435,000.

The Mauer Pipe Co., Wilmington, Del., has been incorporated with a capital of \$50,000 to manufacture pipe. Harry L. Mauer and S. D. Townsend, Jr., Wilmington, are the incorporators.

Plans will be ready shortly by the American Marine Iron Works, St. Johns, Ore., formerly the Valveless Pump Co., to erect another unit for making marine repairs. T. H. Bevety is manager.

Charles A. Anderson & Co., New York, have opened an office in the American National Bank Building, San Francisco, which will be under the management of John C. Wilson.

The Robert Dollar Shipping Co., San Francisco, is planning to build two steamers of 12,000 tons, as soon as "war prices are eliminated," according to a statement from the office of the shipping company.

Because the trend of the shipbuilding industry is away from wood to steel construction, it is said the Foundation Co., now operating four of the largest wooden shipbuilding plants on the Coast, will erect a large steel shipbuilding plant in San Francisco.

Canada

TORONTO, Feb. 3.

The Morrison Steel & Wire Co.'s plant on Burrard Inlet, Vancouver, B. C., which was recently destroyed by fire with a loss of about \$150,000, will be rebuilt. It is the intention of the company to manufacture wire nails for export, equipment for which will soon be purchased.

Hutchinson Brothers & Co., Ltd., Victoria, B. C., has received an order for propelling engines from the Foundation

Co., totaling about \$250,000, and has taken over the sash and door factory formerly operated by Cousins Brothers. It is also the intention to build a new foundry, for which considerable new machinery will be required.

The Cameron Lumber Co., Victoria, B. C., will build a foundry on a site adjacent to the city's storage yards, and will be in the market for equipment.

The Stinson-Reeb Builders' Supply Co., 45 St. Alexander Street, Montreal, is in the market for a portable locomotive or upright type boiler, 25 to 35 hp., complete.

H. R. Corbett & Co., 44 Bank of Ottawa Building, Montreal, are in the market for two 3 to 5-ton electric hoists.

The Barrett Co., Ltd., Marpole, B. C., has purchased a site of six acres and will erect a mill for the manufacture of roofing and paving materials.

The International Harvester Co., Regina, Sask., will dispose of its present quarters here and will build a plant at the corner of Sixth Avenue and Broad Street, to cost \$1,000,000.

The United Iron Works & Machine Co., Ltd., Hallebury, Ont., recently incorporated with a capital stock of \$100,000 to manufacture machinery, etc., will start work at an early date on the erection of a foundry to cost \$75,000.

William Kennedy & Sons, Ltd., Owen Sound, Ont., is in the market for one 15-ton electric traveling crane, 39 ft. 10 in. span; 3 motors, 60-cycle, three-phase, 550 volts.

The National Shipbuilding Co., Ltd., Goderich, Ont., is in the market for new machinery for its plant, including a 6-ft. radial drill; lathe, 12 ft. between centers, etc.

The Canada Wire & Cable Co., Ltd., Leaside, Ont., is installing machinery for manufacturing a full line of steel wire rope. It expects to have the plant in operation by March 15.

M. G. S. Price, engineer, 309 Broadway, New York, has been appointed architect for pulp mills costing \$1,000,000 to be erected at Chicoutimi, Que., for Price Brothers & Co., Ltd., 56 St. Peter Street, Quebec.

The Siemon Tractor Corporation, New Hamburg, Ont., will make alterations and improvements to its plant and install additional machinery. J. E. Siemon is manager.

F. McCullough will build a 2-story factory at Oshawa, Ont., for the manufacture of automobile accessories, etc., to cost \$60,000.

Alexander W. Adams, 55 West Lodge Avenue, Toronto, is in the market for a 500-hp. engine.

An explosion and subsequent fire at the works of the Hull Steel & Iron Foundries, Ltd., Hull, Que., Jan. 26, caused considerable damage to the building and machinery, which will have to be replaced.

Charles T. White & Son, Ltd., Sussex, N. B., is in the market for a 3-phase alternating generator, 1000 light capacity.

Krug Brothers & Co., Chesley, Ont., are in the market for a hydraulic veneering press.

Captain Storm, St. John's, Newfoundland, plans the erection of a pulp and paper mill on the Terra Nova River, at a cost of \$1,000,000.

Government Purchases

WASHINGTON, Feb. 3.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, for supplies for the naval service, as follows:

Schedule 3710, South Brooklyn, 1 bolt-threading machine, 1 hacksaw, 1 engine lathe, 1 pipe machine, 1 twist drill grinder, 1 double arbor grinder, 1 upright drill and 1 crank shaper, opening March 11; 3714, Alexandria, Va., machining parts, opening March 11; 3715, South Boston, 4 engine lathes, 2 band and hack saws, 1 forge, 1 16-in. jointer, 1 20-in. shaper, 1 pipe-threading machine, 1 steam hammer, 1 arbor saw bench, 1 twist drill grinder, 1 double arbor grinder, 3 vertical and sensitive drills, opening March 11; 3728, Puget Sound, 1 universal disc grinder, 1 polishing machine, 2 polishing and 3 grinding machines, opening March 11; 7736½, 1 engine lathe; 7737½, 1 engine lathe; 7738½, 1 radial drill; 7739½, 1 milling machine; 7740½, 1 radial drill; 7741½, 1 engine lathe, all f.o.b. works, opening Feb. 10; 7745½, San Diego, Cal., machine tools, opening Feb. 14; 7748½, Norfolk, 1 flanging machine, opening Feb. 14; 7752½, Philadelphia, 1 drilling and tapping machine, opening Feb. 14; 7756½, Washington, 2 molding machines, opening Feb. 18.

The Sales Board of the United States Spruce Production Corporation, Yeon Building, Portland, Ore., will receive proposals until 11 a. m., Feb. 15, for the purchase of its entire equipment, principally located at Vancouver, Wash., and consisting of locomotives, donkey engines, locomotive cranes, electric motors, railroad cars, motor trucks, trailers, etc.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

Iron and Soft Steel Bars and Shapes		Per lb.
Bars:		
Merchant iron, base price	4.57c	
Refined iron, base price	5.32c	
Burden's H. B. & S. bar iron, base price	6.30c	
Burden's best bar iron, base price	6.50c	
Norway bars, base price	20.00c	
Soft Steel:		
1/4 to 1 1/4 in., round and square	3.97c	
1 to 6 in. x 3/8 to 1 in.	3.97c	
1 to 6 in. x 1/4 and 5/16	4.07c	
Rods—1/8 and 11/16	4.02c	
Bands—1 1/2 to 6 x 3/16 to No. 8	4.57c	
Shapes:		
Beams and channels—3 to 15 in.	4.07c	
Angles:		
3 in. x 1 1/4 in. and larger	4.07c	
3 in. x 3/16 and 1/8 in.	4.32c	
1 1/2 to 2 1/2 in. x 1/8 in.	4.32c	
1 1/2 to 2 1/2 in. x 3/16 in. and thicker	4.07c	
1 to 1 1/4 in. x 3/16 in.	4.12c	
1 to 1 1/4 in. x 1/8 in.	4.17c	
7/8 x 7/8 x 1/8 in.	4.22c	
3/4 x 1/8 in.	4.27c	
5/8 x 1/8 in.	5.07c	
1/2 x 3/32 in.	5.77c	
Tees:		
1 x 1/8 in.	4.47c	
1 1/4 in. x 1 1/4 in. x 3/16 in.	4.37c	
1 1/2 to 2 1/2 x 1/4 in.	4.17c	
1 1/2 to 2 1/2 x 3/16 in.	4.17c	
3 in. and larger	4.12c	
Merchant Steel		Per lb.
Bessemer machinery	3.97c	
Tire, 1 1/2 x 1/2 in. and larger	3.97c	
Toe calk, 1/2 x 1/8 in. and larger	4.72c	
Open-hearth spring steel	8.00c	
Standard cast steel, base price	16.00c	
Extra cast steel	18.00 to 20.00c	
Special cast steel	23.00 to 25.00c	
Tank Plates—Steel		4.27c
1/4 in. and heavier		
Sheets		
Blue Annealed		Per lb.
No. 8 and 3/16 in.	5.12c	
No. 10	5.17c	
No. 12	5.22c	
No. 14	5.27c	
No. 16	5.37c	
Box Annealed—Black		
Soft Steel		Wood's
C. R., One Pass,		Refined,
per lb.		per lb.
Nos. 18 to 20	6.02c	
Nos. 22 and 24	6.07c	7.62c
No. 26	6.12c	7.67c
No. 27	6.17c	
No. 28	6.22c	7.82c
No. 29	6.32c	
No. 30	6.42c	
No. 28, 36 in. wide, 10c higher.		
Genuine Russia, as per assortment	22 1/2	@ 25c
Patent planished, W. Dewees Wood.		
A 13 to 13 1/4c; B 11 to 11 1/4c net		
Galvanized		Per lb.
No. 14	6.67c	
No. 16	6.82c	
Nos. 18 and 20	6.97c	
Nos. 22 and 24	7.12c	
No. 26	7.27c	
No. 27	7.42c	
No. 28	7.57c	
No. 30	8.07c	
No. 28, 36 in. wide, 20c. higher.		
Corrugated Roofing, Galvanized		
2 1/2 in. corrugations, 10c. per 100 lb. over flat sheets.		
Brass Tubes, Rods and Wire, and Copper Tubes		

Manufacturers have withdrawn all quotations because of unsettled prices of raw materials and will only name prices to actual buyers.

On a number of articles the base price only is given it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

Copper Sheets

Sheet copper, hot rolled, 16 oz., 29c. to 31c. per lb.
Cold rolled, 14 oz. and heavier, 1c. per lb. advance over hot rolled.
Polished, 20 in. wide and under, 1c. per sq. ft. extra over 20 in. wide, 2c. per sq. ft. extra.
Planished copper, 1c. per sq. ft. more than polished.
Tinning, one side, 6c. per sq. ft.

Tin Plates

		Coke—14x20	Primes	Wasters
Grade	Grade			
"AAA"	"A"			
Charcoal	Charcoal			
14x20	14x20			
IC	\$11.65	\$10.40	80 lb.	\$8.70
IX	13.85	12.35	90 lb.	8.80
IXX	15.60	14.10	100 lb.	8.90
IXXX	17.35	15.85	IC	9.15
IXXXX	19.10	17.60	IXX	10.30
			IXXX	11.45
			IXXXX	12.60
				12.35
				13.50

Terne Plates

	8-Lb. Coating 14x20	
100 lb.		\$8.80
IC		9.00
IX		10.00

Tin

Straits pig	74c to 75c
Bar	85c to 90c

Copper

Lake Ingots	23c to 24c
Electrolytic	23c to 24c
Casting	23c to 24c

Spelter and Sheet Zinc

Western spelter	10c to 11c
Sheet zinc, No. 9 base, casks	15c; open 15 1/2c

Lead and Solder*

American pig lead	7c to 7 1/2c
Bar lead	.8c to 9c
Solder 1/2 & 1/2 guaranteed	.46c
No. 1 solder	.41c
Refined solder	.35c

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	90c
Commercial grade, per lb.	.50c

Antimony

Asiatic	10c to 11c
---------	------------

Bismuth

Per lb.	\$4.50 to \$5.00
---------	------------------

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting (carload lots), f.o.b. mill, per lb.	33.10c
In small lots	.38c to 40c

Old Metals

The market continues dull. Dealers' buying prices are nominally as follows:

	Cents Per lb.
Copper, heavy and crucible	16.00
Copper, heavy and wire	15.00
Copper, light and bottoms	12.50
Brass, heavy	9.50
Brass, light	7.50
Heavy machine composition	15.00
No. 1 yellow rod brass turnings	9.50
No. 1 red brass or composition turnings	13.50
Lead, heavy	4.00
Lead, tea	3.00
Zinc	5.00

